Next Generation and New Values
ICT Policies and Practice in Japan

Akira TERASAKI
Vice Minister for Policy Coordination
Ministry of Internal Affairs and Communications, JAPAN
1 Japan’s initiatives in ICT

2 Initiatives to promote next-generation technology
   2.1 Initiatives in the mobile phone sector
   2.2 Initiatives in Broadband Mobile Wireless Access Systems

3 International contributions using ICT
   Initiatives in the global environment and climate change
Results of e-Japan Strategy

**Infrastructure**

- **Trends in broadband usage charges and contracts**
  - Usage Charge: Approx. 1/3
  - Mar 2001: 7,800 yen
  - Mar 2006: 2,600 yen
  - Approx. 0.9 million contracts
  - Approx. 22 million contracts
  - Subscribers: Approx. 26 times

- **Rate of HP publishing in public schools**
  - Mar 2001: Approx. 30%
  - Mar 2006: Approx. 76%
  - Approx. 2.5 times

**Life-Human Resources**

- **Rate of HP publishing in public schools**
  - Mar 2001: Approx. 30%
  - Mar 2006: Approx. 76%
  - Approx. 2.5 times

**e-Government**

- **Percentage of national procedures that can be performed by electronic application and notification**
  - Mar 2001: 1%
  - Mar 2006: 96%

**e-Commerce**

- **Internet trading rate on the stock market**
  - Mar 2001: 6%
  - Mar 2006: 32%
  - Approx. 5.4 times

※Buy/sell price total base
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Data communications traffic is expected to quadruple between 2007 and 2010. (Voice traffic is expected to increase by 20% over the same period.)

- Peak mobile phone traffic volumes (2009 and beyond are estimated values)
3G Mobile Communications System Evolution Roadmap

- **2G**
  - W-CDMA
  - CDMA2000

- **3G**
  - 3G
  - W-CDMA
  - CDMA2000
  - 3.5G
  - HSPA
  - EV-DO

- **3.9G**
  - LTE
    (Long Term Evolution)
  - UMB
    (Ultra Mobile Broadband)

- **4G**
  - IMT-Advanced
  - Mobile 100Mbps
  - Nomadic 1Gbps

- Advancement of services ex. Music, Game, etc.

- Realization of High-speed Data Transmission and Low-latency and Fulfillment of Unconstrained Wireless Access

- 2000
- 2010

- 3G Voice Internet
- 3.5G Voice Internet
- 3.9G Voice Internet
- 4G Voice Internet

- ~several kbps ~384kbps ~14Mbps Over 100Mbps 1Gbps
Generation Shift of the Mobile Phone Networks

- Assuming that the 4G network will be built efficiently by exploiting the 3.9 G facilities

(1) Around 2001 (Introduction of the 3G)

(2) Around 2008 (Today: Expansion of the 3.5 G)

(3) Around 2010 (Introduction of the 3.9G)

(4) 2010s (Introduction of the 4G)

(5) 2020s (Spread of the 4G)
Promising Features of the 3.9G Global Mobile Communication System

**Cutting-edge Wireless Access**
- High-speed, high-volume access
- Reduced delay
- High relay quality
- Improved cell throughput
- Scalable frequency bandwidth

**Globalization**
- International interoperability
- Smooth migration to the 4G mobile communications system
- System has a low environmental footprint

**Flexible Network**
- All IP
- Open network/open interface for inter-system seamless integration
- Create a cross-device environment compatible with many devices
- Network architecture simplification/flat network architecture

**Effective Use of Frequency**
- Optimize frequency usage rate (bps/Hz)
- Increased effectiveness of frequency use through promotion of MVNO, which promises a wide range of new services

**User Friendliness**
- A variety of devices with advanced features to service a wide range of users—from the everyday user to the advanced user
- Establish the necessary QoS in communications speed, security, and other areas
- An open system that is also safe and secure
- Interoperability in content and services
- Low bit-price through reduction of equipment and operation costs
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Main Usage Scenarios for Broadband Mobile Wireless Access Systems

Mobile usage

Nationwide deployment by telecoms with a focus on urban areas. Services that support medium-speed movement are also provided.

Stationary usage

In areas with poor reception, relatively long-range relay links and subscriber lines are provided, which make use of high-gain antennas.

Urban areas

Area configuration for mobile phones (transmission range of 1–1.5 km)
The Broadband Mobile Wireless Access System Business Domain

**Broadband Mobile Wireless Access**
- Emphasis on data communications speeds
- Low-cost wireless broadband connection offered for a variety of devices
- Horizontal business model

**Mobile phones**
- Emphasis on quality of voice communications
- Limited by type of data communications device and charge rates
- Vertical integration business model

**Service characteristics**
- Data specialization
- All-IP networks

**Device characteristics**
- Emphasis on compactness and lightweight
- Speech-centric
- Line-switching networks

(Reference) Speed comparison for major wireless communications services

<table>
<thead>
<tr>
<th></th>
<th>Maximum communications speed</th>
<th>Reception range</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G mobile phones (HSPA)</td>
<td>3.6 Mbps (14.4 Mbps)</td>
<td>2–3 km</td>
</tr>
<tr>
<td>Current wireless LANs</td>
<td>54 Mbps</td>
<td>100 m</td>
</tr>
<tr>
<td>WiMAX</td>
<td>Order of 20 Mbps</td>
<td>Several km</td>
</tr>
<tr>
<td>XGP(eXtended Global Platform)</td>
<td>Order of 20 Mbps</td>
<td>Several km</td>
</tr>
</tbody>
</table>

- Video-compatible interfaces, etc.
Features of the XGP*(eXtended Global Platform)

1. Cost
   ・Devices based on OFDMA technology that were introduced in WiMAX and LTE can be used for XGP system with only minor design or software changes.

2. Cell Structure
   ・The size of a microcell in rural areas can be as large (several km of radius) as other OFDMA systems.
   ・In urban areas, it is possible to reduce cell size, which results in greater capacity.

3. Autonomous Control
   ・With the adoption of autonomous control, it is easy to build a wireless network both in rural and urban areas.
   ・The convenience of autonomous control will be exploited in network maintenance and cell design phase.
   ・It is possible to construct and operate a wireless network without requiring in-depth knowledge of frequency operations (Optimum frequencies are automatically selected).

*Also known as the next-generation PHS
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Outline of Research Seminar on ICT Policy for Combating Global Warming

- In order to reduce CO₂ emissions, it will be necessary to reduce the production of CO₂ in the ICT industry itself.
- With widespread use of ICT it will be possible to help to reduce CO₂ emissions, by drastically improving efficiency in manufacturing, consumption, and business, by substituting transportation needs and by alleviating traffic congestion.
- It is possible to conduct environmental measurement and forecasting using ICT.

### Improved efficiency in energy usage
- ITS (ETC, VICS, central control of traffic signals)
- BEMS (Business Energy Management Systems)
- HEMS (Home Energy Management Systems)

### Reduced movement of goods and people
- Online shopping, on-line transactions
- Telecommuting, teleconferencing
- Distribution of music, movies, and software
- Online application procedures (Online tax filing, Online prescriptions)

### Environmental measurement and forecasting
- Supply chain management
- Electronic publishing and delivery
- Paperless offices
- LIDAR for measuring CO₂ levels
- Sensor networks
- Global simulators

### Widespread use of ICT

Helping to combat global warming by promoting more widespread use of ICT
Total CO₂ Emissions of the ICT Sector, and CO₂ Reductions

Bottom line: 38 million tons (3.0%) of CO₂ emissions reduced
1 Objective

To raise awareness regarding the importance of using ICT to respond to and to reduce the effects of climate change, and to discuss future standardization activities at ITU.

2 Kyoto Symposium

Date: April 15 and 16, 2008
Location: Kyoto International Conference Center
Sponsor: Ministry of Internal Affairs and Communications, International Telecommunications Union (ITU)
Chairman: Takashi Hanazawa, Director of Research and Development Planning Department, NTT

Chairman’s report
- Making devices energy-efficient and use of ICTs in responding to climate change
- To this end, establishing international standards for evaluating the amount of CO₂ emissions reductions using ICT

3 London Symposium

Date: June 17 and 18, 2008
Location: British Telecom Headquarters (London, England)
Sponsor: ITU and BT
Chairman: Mr. Walker, British Department of Business, Enterprise and Regulatory Reform

Chairman’s report
- Direction of activities: Energy efficiency of ICT and use of ICT to improve efficiency in other sectors, changing business/consumer behavior
- Early implementation of international standards concerning ICT and climate change

4 Future plans

- Established a Focus Group in the Telecommunication Standardization Advisory Group (TSAG) (July 2008) and began the study.
- The Focus Group will study reduction of CO₂ emissions by ICT.
Thank You!

Ministry of Internal Affairs and Communications ("MIC"), Japan

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