

Broadband Service in Korea

December 10, 2006

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Success Factors

Evolution of Broadband MarketPlace in Korea

Strategies of the Gov't

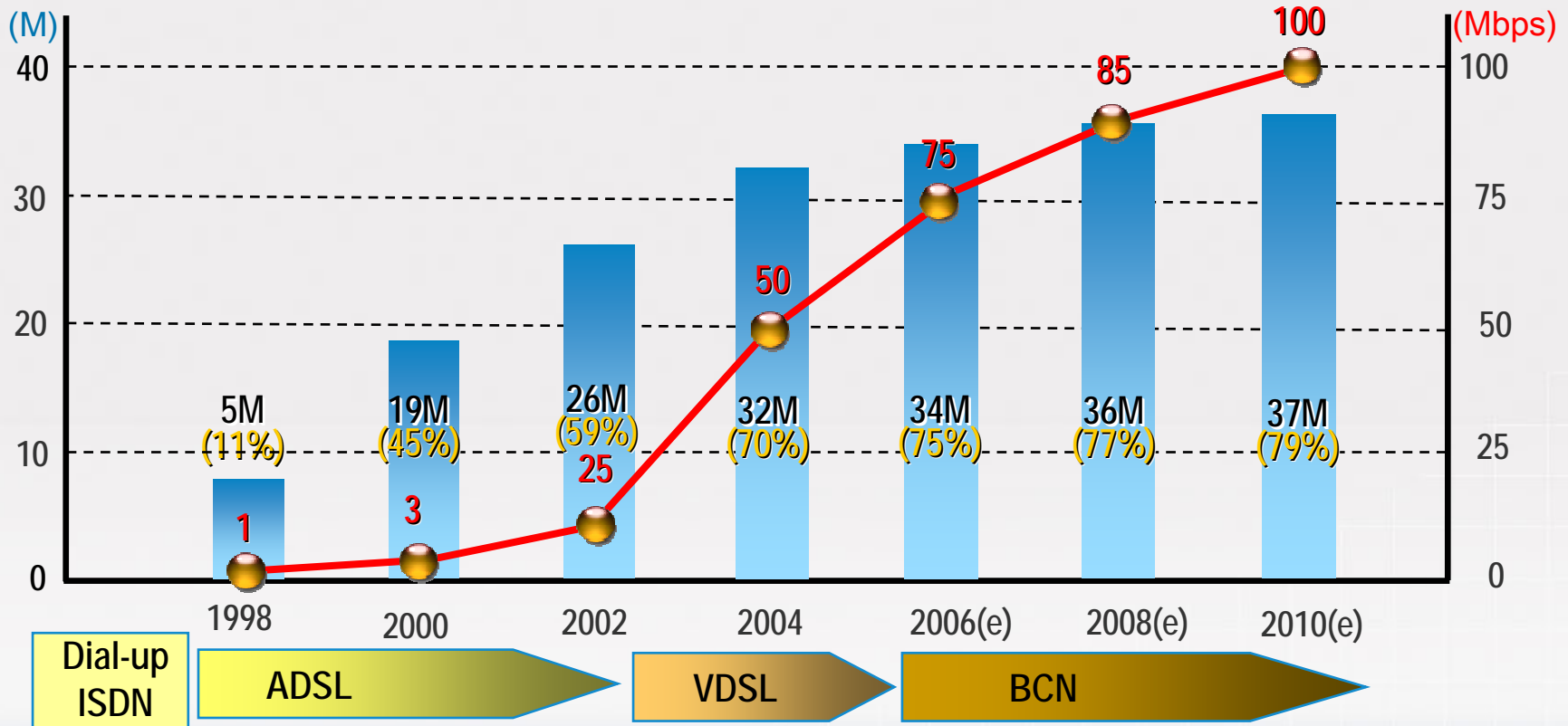
What has been changed and learned?

Broadband Deployment



Number of Internet Users

Premium Service (DR)



Free Competition

- FSPs, free of regulation, concurrently entered the market setting flat retail charges at a low enough level to induce churning of long-hour dial-up users
- Facilities-based competition, intensified moving up to 'last-one-mile' deploying and upgrading access networks

Urban Geography

- Nearly 48 percent of total households live apartment complexes
 - Economies of scale work sufficiently for FSP's market operation
 - Hanaro Telecom targets Apt. Complexes in the form of fiber
 - More than 90 percent of households, located around the wire centers of Korea Telecom

Gov't as a promoter

- Early commitment and promotion by the government has given momentum for creating the recognition on the importance of Informatization.
- Funding at the prime rate for the investment into access networks by FSPs in 1999 and 2000

Dialpad, VoIP Service

“VoIP service, combined with the attraction of free call Service, has played a role as a killer application for the Prevalence of broadband service and vice versa.”

**“IP Telephony and the inter: Republic of Korea Case Study,”
The 3rd World Telecommunications Policy Forum, ITU, March 2001.**

Emphasis on Education

- Broadband seen as family investment in education

Local Manufacturing and Local Content

- Emphasis on R&D(e.g., WiBro)
- High performance IP backbone
- Korean content(e.g., DAUM website) and online games

Phase I : Launch

- High cost and retail charges hinder the rollout of the market
- External subsidies and lowering users' subscription barriers may be necessary to reach critical mass
 - e.g., local charge, handset subsidies, subscription fee discount

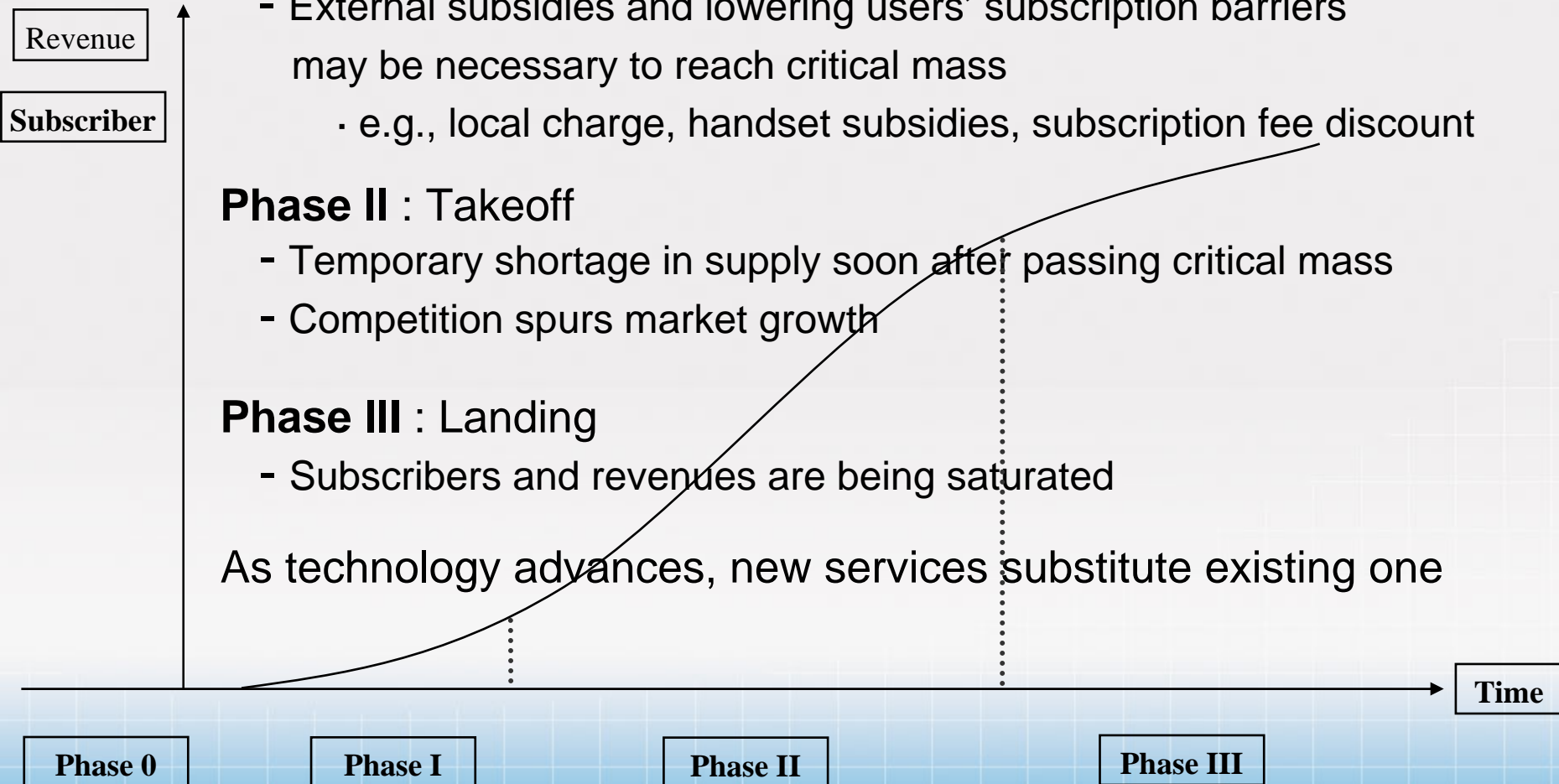
Phase II : Takeoff

- Temporary shortage in supply soon after passing critical mass
- Competition spurs market growth

Phase III : Landing

- Subscribers and revenues are being saturated

As technology advances, new services substitute existing one



Phase 0 : No broadband service market before July 1998

Phase I : Broadband Internet service, initiated by Thrunet and followed by Hanaro and Korea Telecoms
- seven facilities-based providers (FSPs) by the mid 2000

Phase II : Facilities-based competition, intensified moving up the 'last-one-mile' deploying and upgrading access networks
- 8.5 million households as of April 2002

Phase III : 16 million households with 20 Mbps by the end of 2006
- More than 80% of households

■ Phase 0

Problem : Difficulty in spontaneous roll out in the markets

Strategy : ***Industry Promotion, Comprehensive National Plan***, initiated by the gov't

■ Phase I

Strategy : ***Facilities-based competition***, prioritized
Opened with no market regulation except Quality of Service(QoS) monitoring

Result : Phase II, moved up

■ Phase II

Problem 1 : FSP's prone to invest in densely populated areas to maximize economies of scale
Facilities duplicated (waste of national resources)

Problem 2 : The incumbent extended M/S through local loops, while new FSPs has been financially burdened by excessive investment and market promotion
Remote from fair competition

Strategy : ***Local Loop Unbundling***,
Needs to cool down the overheating of facilities duplication and to guarantee fair competition

■ Phase III and Beyond

Problem : concern about ***Widening Digital Divide***

FSPs, reluctant to deploy networks in rural areas

Strategy : Facilitating ***Public Funding*** with prime rate to FSPs

Comprehensive National Plan for Korea Information Infrastructure(KII) in stages, set up in March 1995

- Stage I(1995~1997),Stage II(1998~2000),Stage III(2001~5)

Purpose

- KII-Government: Construction of high-capacity backbone
- KII-Test bed: Furnishing a research environment
- Public Funding Program: lessening burden of FSP's investment in networks

Budget

- \$ 925 million throughout Stages I and II
- \$ 1.896 billion, scheduled throughout Stage III
- Total = \$ 2.829 billion

■ To create market demand for broadband service

- Provided an information education to 10 Million People
(housewives, soldiers, students and senior citizens)
- Provided broadband internet access to all 11,000 schools

■ New lifestyle with Internet

- PC rooms, online games, cyber stock exchange, cyber education, Internet banking etc

■ Early construction of optical networks and continuous promotion of the Information Society through KII project

- Harmonize Backbone and Access Networks
- Provided broadband Internet access to all schools

■ Competitive market policy between telcos

- Granted a license to multiple carriers
- Facilities-based competitions between carriers
- Flat-rate & low price system

■ Certification Program for Premise Network

- Facilitation in-building informatization efforts by endowing buildings & apartments with graded emblems

■ Loans to service providers to construct high speed access network

- Benefits to service providers to construct

■ Household Internet Demand

Community activity (72.1%), On-line game (63.8%), On-line banking(54.2%) have been newly increased

■ Investment as IT Booster

Total amount of investment by 2001 : \$ 4.04 billion

Spillover effects : 7.07 ~ \$ 9.46 billion

Job creation 4,900 ~ 8,300

■ Red Devil and the World Cup

Soccer community organized in 1995 with 10 members, now amounting to 0.2 million

During the World Cup season, Red Devil has led off-net street cheering culminated with 7 million participants

■ Strategy I: Be a first-mover

less inclined to churn (D-3) preempting the market

Procurements costs for related facilities is high

High risk if trial and error

■ Strategy II: Be a follower

Procurements costs may be low and risks may be hedged

The market is preoccupied by the incumbent

■ Observation

New entrants are first-movers in Korea and Japan in the form of fiber ADSL

The incumbent, reluctant to be a first-mover, e.g., worrying about substitution between dial-up and broadband services

■ Broadband

Strategy I : New facilities (modem, DSLAM) with existing local loop

Strategy II : Replacing it by optic fibers

More or less **dependent on Technology**

■ Mobile

Advances in Technology

- IS-95A/B cdma2000-1x EV-DO EV-DV IMT-2000

Strategy I : Upgrade, using existing networks

Strategy II : Overlay, newly construct

- Investment cost may be saved in the form of overlay, but upgrade is necessary in some phases of migration

■ Observation

Korea Telecom, although late comer, has caught up other service providers through network extension

What Have Learned



1

Facility-based Competition among Different Architectures (xDSL, HFC, etc) was More Effective than Service-based Competition in Deploying Broadband Internet

2

Market Liberalization is Followed by Restructuring as Markets Become Saturated. M&A Increases Monopolistic Power of Some Players, Attracting Government's Intervention

3

Due to Cross-Cannibalization, We Need to Pay Special Attention to Competition among Different Lines of Services.
ex) Fixed vs. Mobile, MMS (Mobile Multimedia Service) vs. DMB, 1xEV-DO vs. WiBro

4

As Market Transition Becomes Faster, Contingent Regulatory Policy for Short-lived "Bridging Services" might Help Reduce the Regulatory Risk.

5

Proactive Regulatory Planning is very Important to Avoid Unnecessary Conflict of Interests among Regulators and Stake-holders in Developing Emerging Convergence Markets

6

"Invisible Hand" is definitely Superior to "Ubiquitous Hand." But "Invisible Hand" is only a Necessary Condition for Success. "Invisible Hand" with "Ubiquitous Mind" will Do.

Government Roles in Korean IT



- Service Spec Determination
- License Approval
- Frequency Allocation
- Competition Policy
- Legal System

- Basic Research
- Pilot Project Launch
- Financial Support
- Human Resource Development

- IPR Protection
- Conflict Arbitration
- Fair Competition

- International Cooperation
- National IR

Government

Private

- Service Business Planning

- R&D Activity
- Infrastructure Investment
- Global Standardization

- Product/Technology Development
- Pilot Production
- Application & Solution
- IP Creation

- Mass Production
- Cost Reduction
- Job Creation
- Global Marketing & Export
- Reinvestment for Next Growth Engine

Korea's Journey on Informatization

