Helping the world communicate

International Telecommunication Union

Symposium on Telecommunications
to Commemorate the 10th Anniversary of the
Fourth Protocol to the GATS
20-21 February 2008, Geneva, Switzerland

ICT Market Trends

Vanessa Gray
Market Information and Statistics Division
Telecommunication Development Bureau
International Telecommunication Union

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Market characteristics post BTA

Open trade in telecommunication services has contributed to:

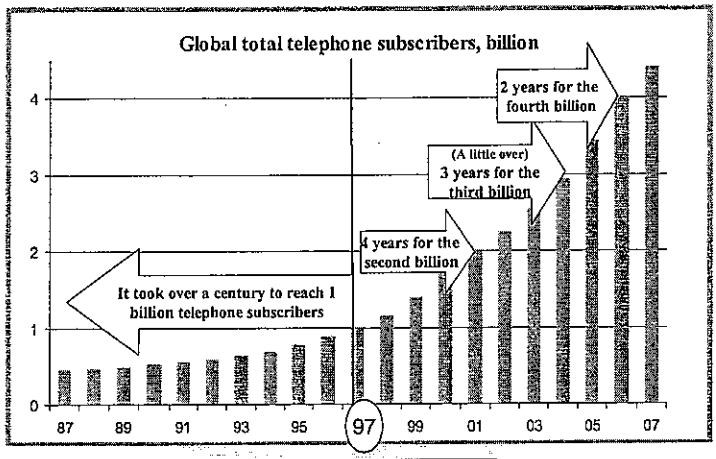
On the business/public sector side

- Competition and privatization
- New market opportunities
- Higher levels of investments and revenues
- New business models and technological innovations

On the consumer side

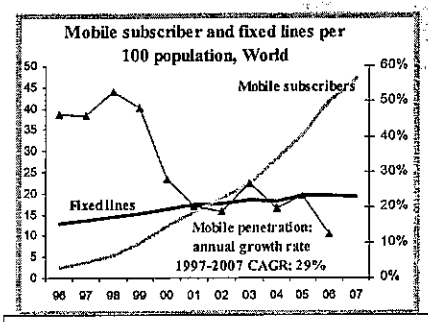
- Lower prices for businesses and consumers
- More consumer choices through new products, services and applications
- Higher ICT levels

10 years before and after the BTA



Source: ITU World Telecommunication/ICT Indicators Database

Competition and growth in the mobile sector



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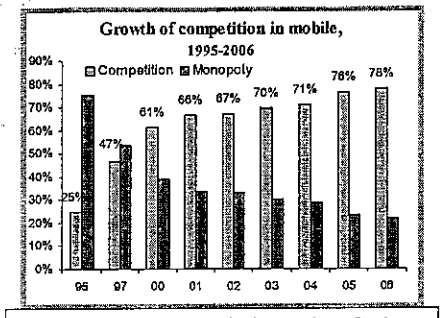
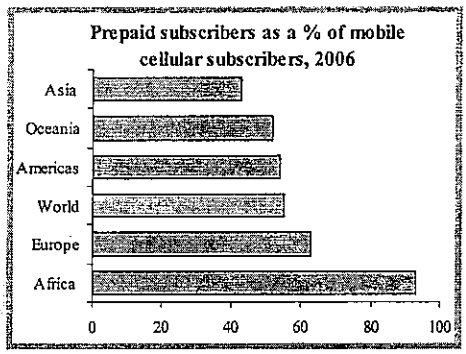


Source: ITU World Telecommunication Regulatory Database

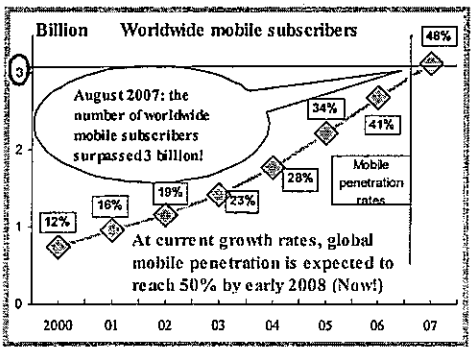
Secrets of success

- Affordability
  - Although rebalancing initially increased local call prices, international calls and mobile and Internet tariffs have decreased substantially over the last decade
- Accessibility
  - In 2006, global mobile population coverage was 79%
- Innovation in applications, services & devices
  - Prepaid (flexibility, low-income groups)
  - SMS (affordable, easy to use)
  - Ultra-low-cost handsets



Source: ITU World Telecommunication/ICT Indicators Database

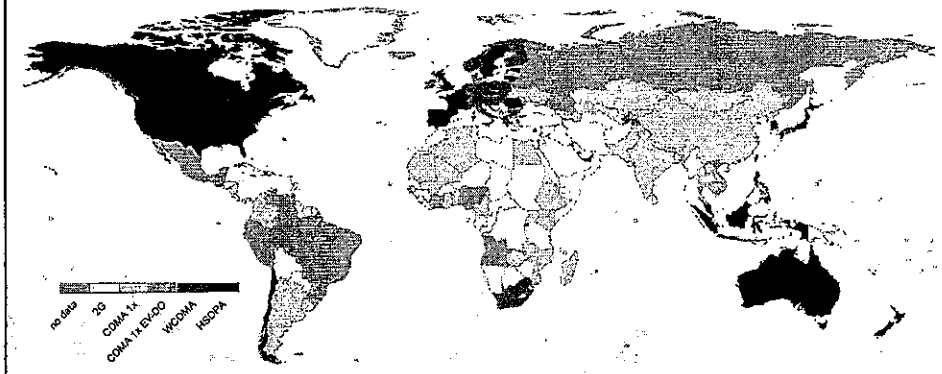
Mobile sector…still room for growth?



Source: ITU World Telecommunication/ICT Indicators Database

- Majority of new subscribers during 2007 come from BRIC economies
  - Brazil: 15 million
  - Russia: 20 million
  - India: 45 million
  - China: 80 million
- From 2G to 3G and +
  - Despite 3G auction rollercoaster and delays in rollout, more and more countries today are licensing commercial 3G networks
  - 3G subscriber numbers on the rise

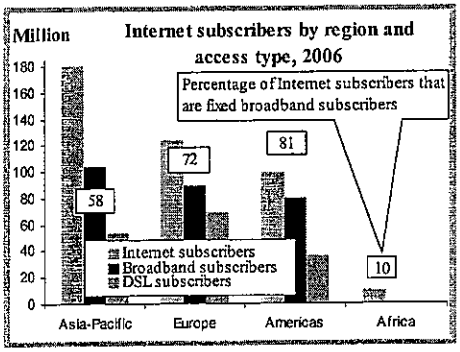
IMT worldwide, 2007



Source: ITU World Telecommunication Regulatory Database

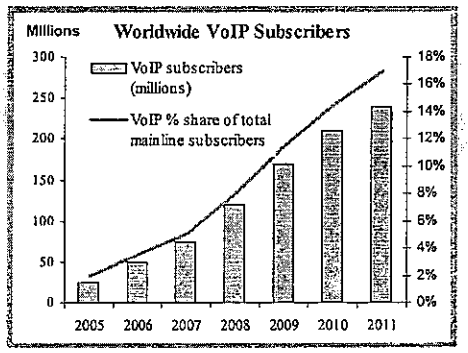
Globalization of the Internet…

- From 117 million Internet users in 1997 to over 1.2 billion today
- Move from low to high speed
  - Rep. of Korea is already 100% broadband
  - Major differences in fixed broadband penetration levels between countries and regions



Source: ITU World Telecommunication/ICT Indicators Database

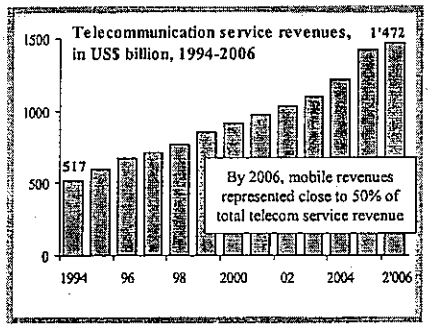
The changing face of the sector

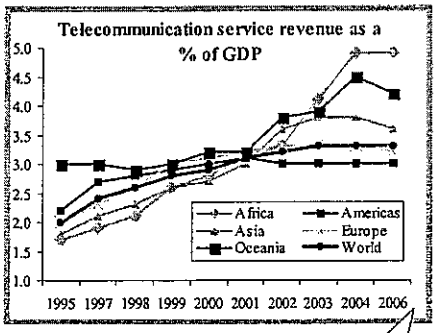


Source: iDate.

- Wireless technologies
- NGN and services
  - VoIP
  - Bundled and triple play packages
  - IPTV, VoD

Revenues





Source: ITU World Telecommunication/ICT Indicators Database

Telecom services sector is estimated to represent over 3.2% of global GDP

Business is 'mobile'

- Global Telecommunication/ICT sector is characterized by cross-border competition and strategic investors
- Take Africa: Top ten MNO (in terms of subscribers) include strategic investors and companies from Africa and abroad
  - MTN, Orascom Algeria, Glo Mobile, Vodacom
  - Vodafone, STC, Maroc Telecom/Vivendi, Mobilnil/Orange
- Although focus has been on mobile sector, fixed line market is increasingly open to competition and FDI
- Fierce competition has led operators to adopt new business models and target previously unconnected/rural areas and low-income groups to increase their subscriber base

February 2008: Vodafone announces plans to add another 100 million (mainly rural) customers in India over the next three years

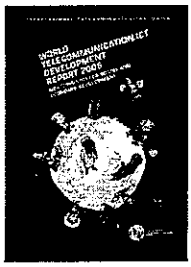
The broader impact of ICTs

- Growth and developments in telecommunications and ICT have led not only to higher ICT access levels and growing revenues in the sector itself
- Although more difficult to measure, there is clear evidence for the indirect positive impact of ICTs on
  - Productivity - Transparency
  - Development (MDGs/WSIS)

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

OECD

January 2008 study on: Measuring the Impacts of ICT Using Official Statistics



Thank You

For further information, contact:
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WTO, Geneva, Switzerland

10 years of regulatory trends

Susan Schorr, Head, a.i., Regulatory and Market Environment Division
BDT, International Telecommunication Union

Agenda

- Intro
- First wave of regulatory reform: ICT Market and Regulatory Trends
- Is it time for a second wave?

WTO Reference Paper 1997

Topics covered:

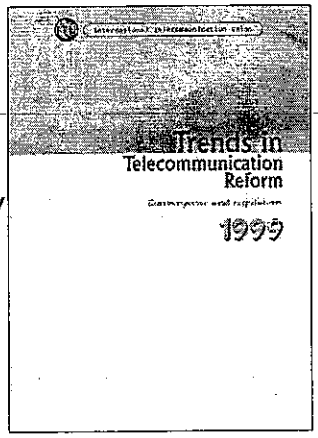
1. Competition
2. Interconnection
3. Universal Service
4. Licensing
5. Independent Regulators
6. Allocation of scarce resources

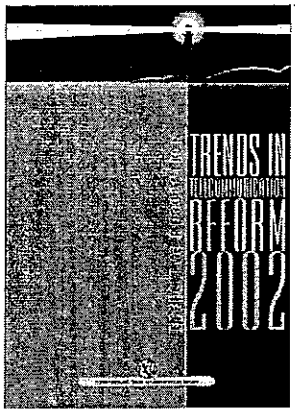
Regulation in an era of convergence

- Flexibility & forward-looking approach being adopted worldwide, but tailored to local circumstances, towards a converged regulatory framework
- Converging technologies (FMC, etc.)

Changing focus:

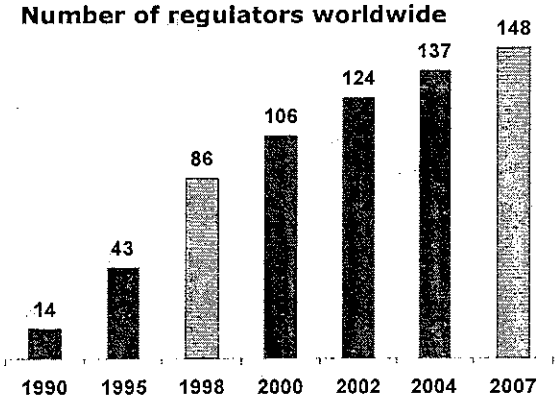
- From regulating voice towards regulating data services, multimedia, broadcasting: regulatory parity
- From regulating multiple services over multiple delivery platforms towards NGN regulation
- From regulating PSTN to regulation IP
- Infrastructure sharing
- From heavy-handed regulation to light-touch approach, but also functional separation
- Transparency & accountability
- Adopting and enforcing of clear rules
- Complexity vs. simplicity (i.e. interconnection, etc.)
- International cooperation



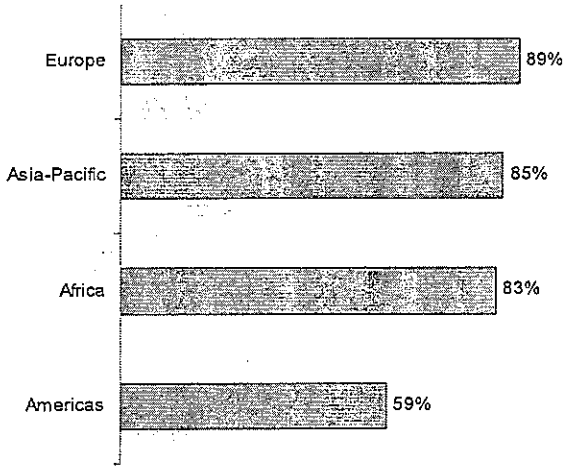


Effective regulation

Number of regulators worldwide



Percentage of regulators in each region, 2007



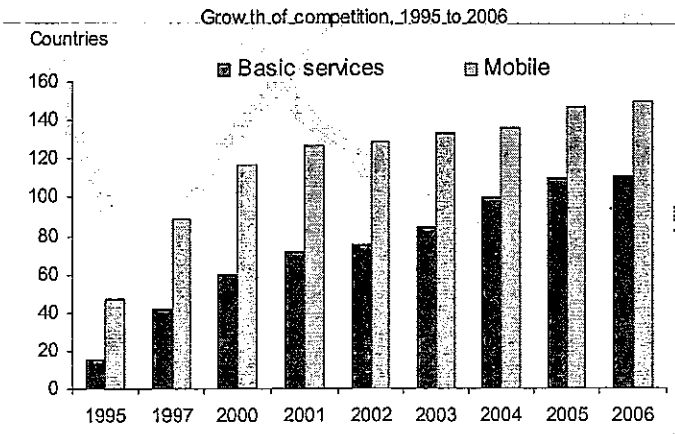
Source: ITU World Telecommunication Regulatory Database

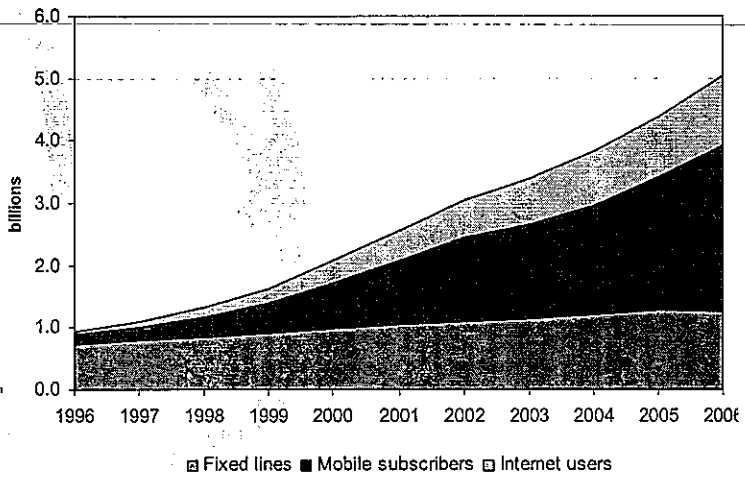
February 2008

Competition

Growth in competition and in nb of subscribers, selected services

Growth in fixed lines, mobile cellular subscribers and Internet users, in billions, 1996-2006





Source: ITU World Telecommunication Regulatory Database

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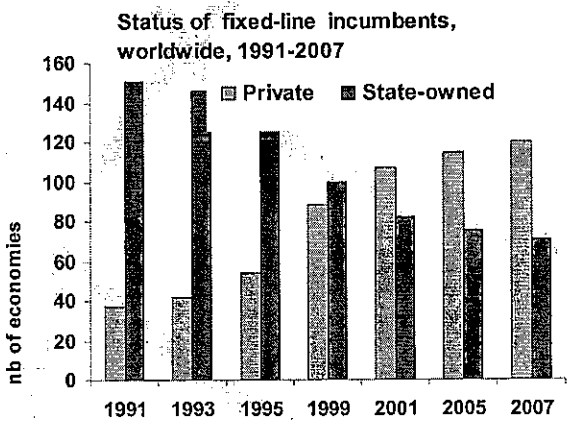
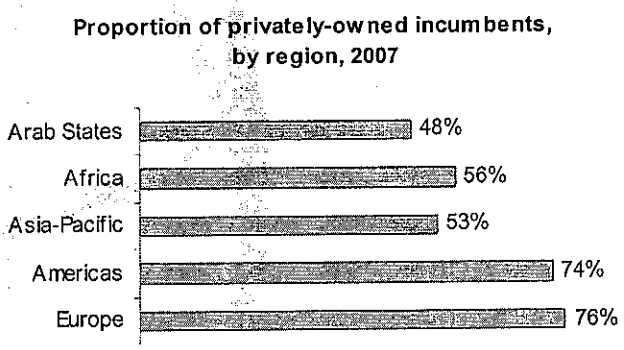
Private ownership worldwide, 2007





Source: ITU World Telecommunication Regulatory Database

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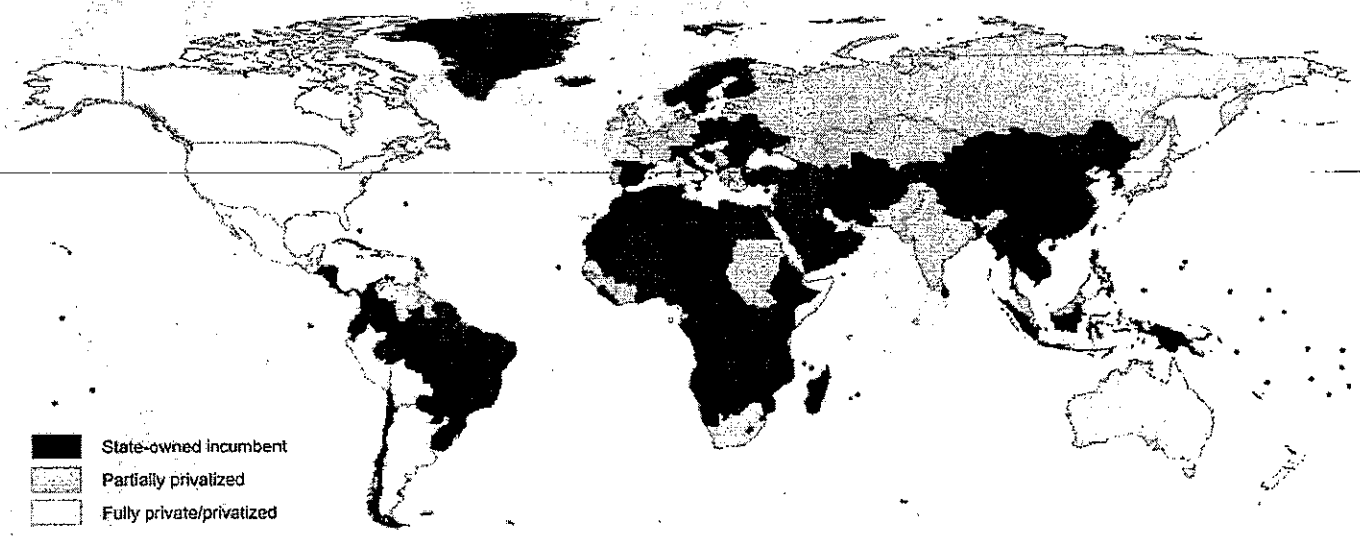
Sector reform

Privatizations of incumbent operators worldwide, 1997



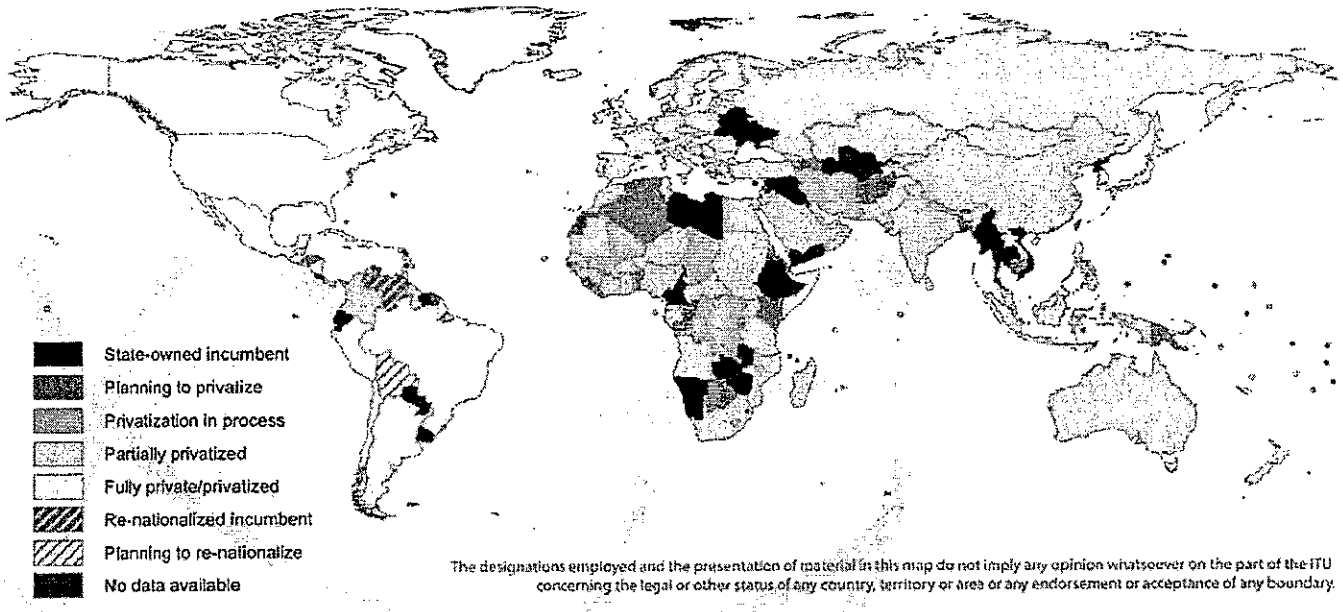
The designations employed and the presentation of material in this map do not imply any opinion whatsoever on the part of the ITU concerning the legal or other status of any country, territory or area or any endorsement or acceptance of any boundary.

Source: ITU World Telecommunication Regulatory Database

February 2008

Sector reform

Privatizations of incumbent operators worldwide, 2007



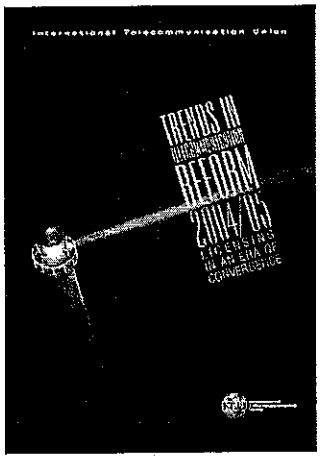
Source: ITU, Trends in Telecommunication Reform 2007: The Road to NGN.

Functional Separation

- A new kind of re-structuring?
- Separation of legacy fixed line operators' non-replicable or bottleneck assets into a new business division which provides wholesale access
- This wholesale access division is kept separate from the incumbent's own retail divisions
- Australia, Ireland, Italy, Mongolia, New Zealand, Sweden and U.K.

Licensing

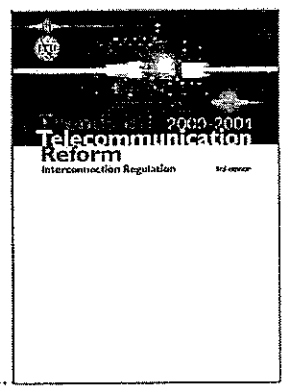
- Technology and service neutrality
- Transparency (criteria, procedure time, terms, etc.)
- Expansion in the number of services that are subject to only minimal or even no licensing, and
- Development of converged licensing frameworks that break down traditional service-based and technology-based licensing distinctions.
- Ensuring a level playing field between legacy operators and new market players
- What about Voice over IP?



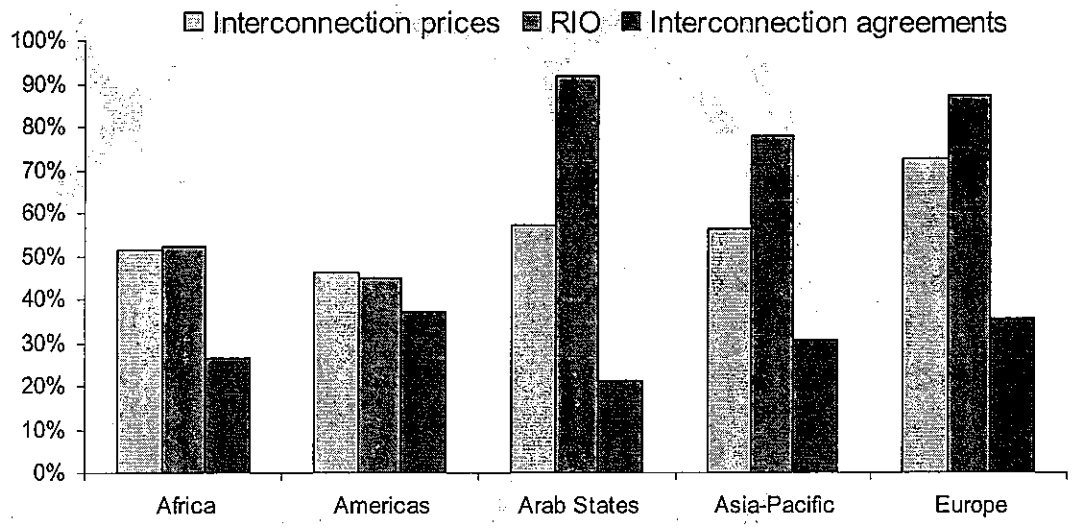
» **GSR Best Practice Guidelines on Licensing (2004)**

Interconnection Trends

- **Who has to provide?**
  - Different countries may require interconnection from **incumbents** or **dominant operators** or **operators with SMP**
  - Increasingly, countries take a technology neutral approach and impose interconnection obligations on **all network operators**
  - Still **asymmetric regulation** places heavier interconnection obligations placed on major suppliers
- **When is it provided?**
  - Immediately through Reference Interconnection Offer
  - Deadlines (e.g. 3 months – to 135 days from time of request)
- **How much does it cost?**
  - Cost-oriented rates, using fully allocated costs, LRIC or others
  - Benchmarking
  - Privately negotiated
- **What information is available?**
  - Role of regulators' websites to publish RIOs
- **Dispute settlement**



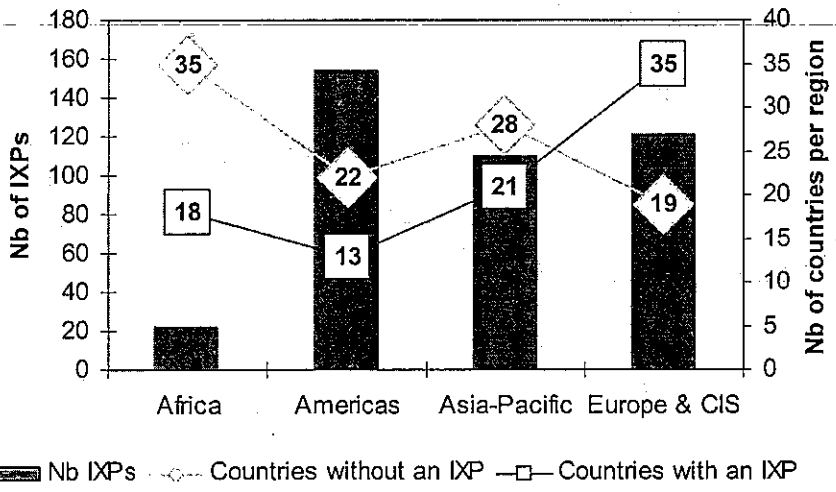
What interconnection information is made publicly available?



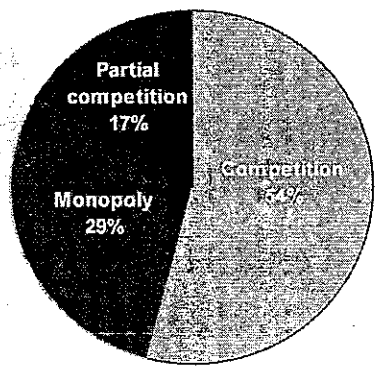
ITU World Telecommunication Regulatory Database (2005 & 2006)

IXPs and International gateway liberalization

Number of IXPs and number of countries with and without IXP, by region, 2007

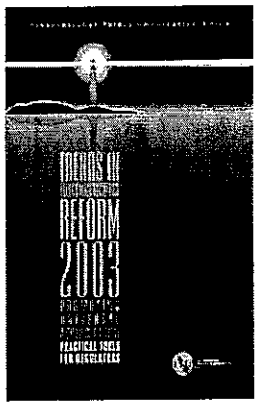


Liberalization of the int'l gateway worldwide, 2007



Source: ITU World Telecommunication Regulatory Database

Universal access



- **Universal Sevice Obligation**
  - Traditional Approach Implemented By Placing Obligations on Fixed Line Monopoly Operator
  - Goal: universal household connections
  - Largely achieved in developed world
- **Universal Access Opportunity**
  - First step: Sector reform measures
  - Use of funds and smart subsidies combined with competitive auctions
  - Goal: promote public access to un-served areas
  - Mobile communications have reached more voice users than through fixed line USO programmes
  - New steps needed to promote broadband

» **GSR Best Practice Guidelines on Universal Access (2003)**

Competition, Price and Technology

- ✓ Competitive bidding keeps subsidy, if any, low
- ✓ Lack of competition for access services will impact financial viability
- ✓ Price of services to end users and from incoming calls can make or break financial viability
- ✓ Technology choice can push forward the envelope of financial sustainability and affordability

Towards the second wave of sector reform

- Liberalize the international gateways and VoIP to promote IP services
- Leverage on the success in the mobile market to migrate to IMT technologies
- Leapfrog to fiber backbone and backhaul networks, by providing financial and fiscal incentives to encourage the deployment of backbone infrastructure
- Create national IXPs
- Continue to use market liberalization and competition as a force for development
- Think outside the box
  - encouraging network deployment with incentives
  - supporting small-scale deployment in rural areas
  - Using infrastructure sharing and open access models to promote deployment
- Promote cross-border harmonization for issues like international mobile roaming
- Remember where we started? . . . Convergence!
- First steps taken to address convergence; new issues arising for new applications and services like IPTV and mobile broadcasting

Thank you!

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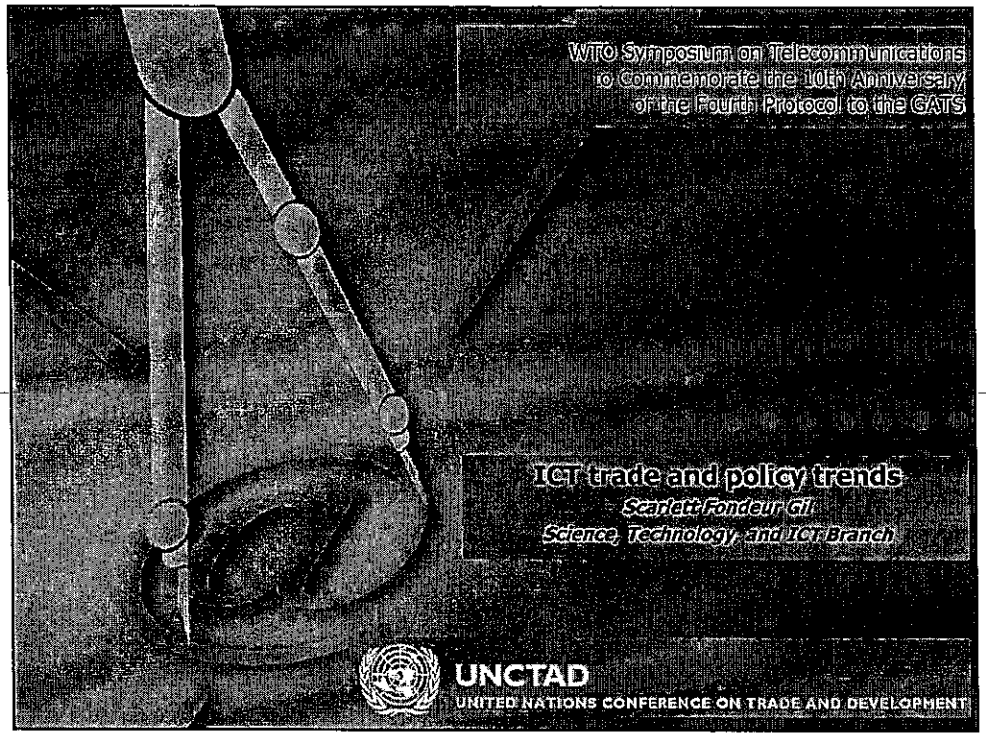


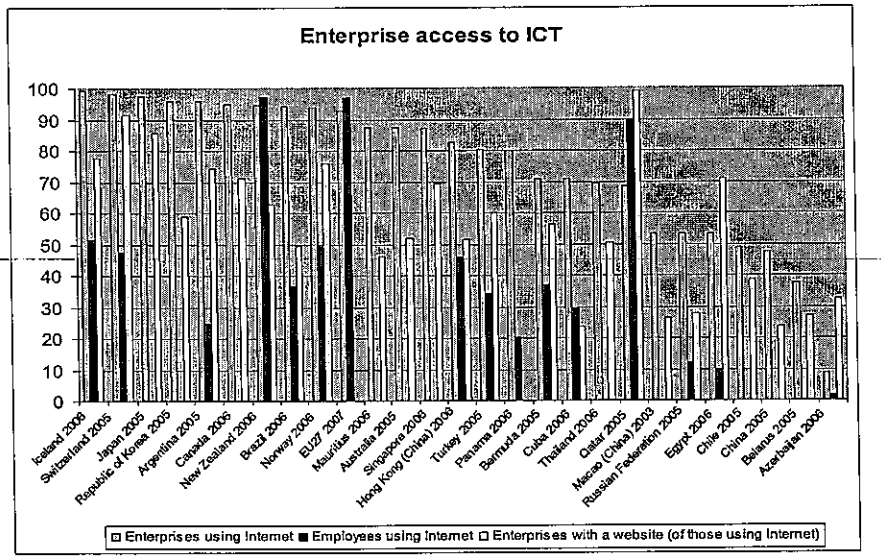
UNCTAD and ICT for development

ICT Measurement	ICT Research & Analysis	ICT Policy	Impact
Data collection Data analysis Data dissemination Standardization	Trends and indicators Impact measurement Benchmarking Digital divide monitoring	Policy design Policy analysis Policy evaluation Policy review	Increase ICT use Boost economic growth

International debate

- Science, Technology and ICT Branch (former ICT and E-Business Branch)

ICT access and use by enterprises



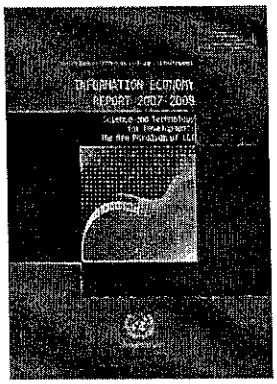
Source: UNCTAD and Eurostat

Measuring the economic impact of ICT

- **Three ways** to examine link between ICTs and growth:

  1. ICT producing sector
  2. ICT investments (all industries)
  3. ICT use by firms

- For literature review, see chapter 3 of the UNCTAD Information Economy Report



The impact of ICT on labour productivity in OECD countries (at the firm level)

- Similar technologies impact differently on firms in different markets - a 10% increase in the share of employees using computers results in:
  - 1.8% higher labour productivity in manufacturing and 2.8% in services in Finland (*Maliranta & Rouvinen, 2003*)
  - 1.3% higher labour productivity in the entire business sector in Sweden (*Hagén & Zeed, 2005*)
  - 2.1% higher labour productivity in manufacturing and 1.5% in services in the UK (*Farooqui, 2005*)

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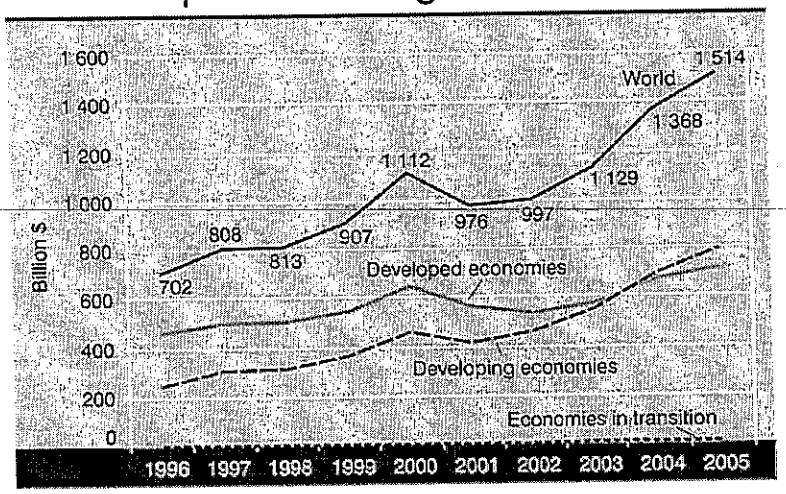
Joint UNCTAD – Thailand NSO Project

Impact analysis of ICT use on labour productivity in Thailand (at the firm level) – preliminary results

- Manufacturing firms with a 10% higher share of employees using computers have on average 35% higher labour productivity
- Basic technologies such as computers still make up for an important share of differences between firms in developing countries
- A higher share of employees using computers makes most difference in terms of production efficiency in:
  - Large firms (more than 80 employees)
  - Middle-aged firms (founded between 1991 and 1996)
  - Firms located in the South
  - Firms engaged in the wood industry (ISIC 20) and machinery & equipment (ISIC 29)

World exports of ICT goods, 1996 - 2005



Source: UN COMTRADE

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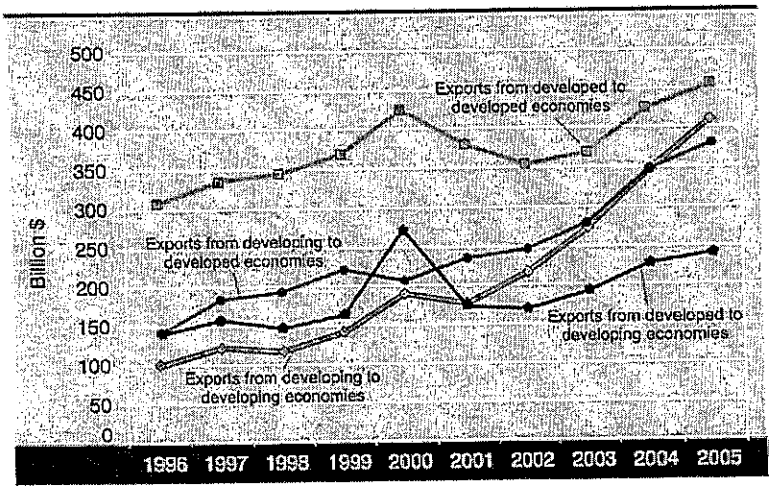
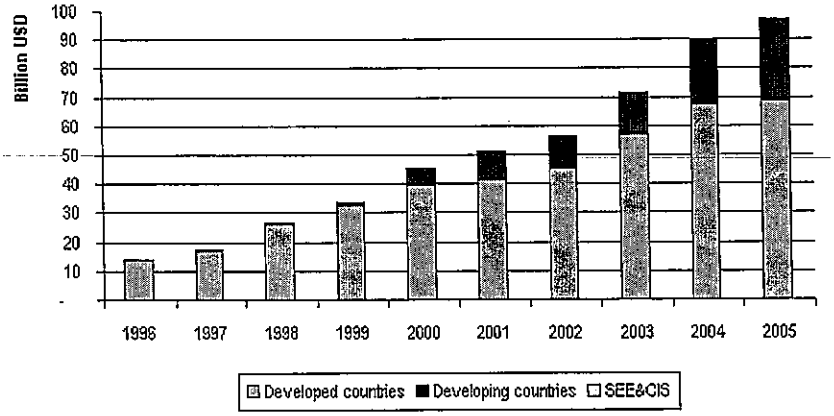
Direction of ICT goods trade originating in developed and developing economies, 1996-2005



Source: UN COMTRADE

Exports of computer and information services by level of development



Source: IMF BOP data and UNCTAD calculations

china
India

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Thank you

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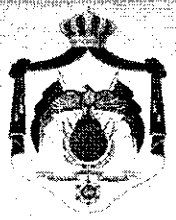

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Implementation Progress and Challenges (Regulators Forum)

Dr. Ahmad Hiasat, Chairman and CEO,
Telecommunications Regulatory Commission (TRC), Jordan

Agenda

- **The WTO Reference Paper on Telecommunications**
  - International Standard for Regulation
  - Provisions in 6 key areas:
    - Competition safeguards
    - Interconnection
    - Universal Service
    - Licensing
    - Independent Regulation
    - Scarce Resources
- **Impartial Regulation**
  - The regulator's judgement is not fettered
  - The regulator acts independently and without bias
  - The regulator acts objectively

Independence

- **Division of responsibilities:**
  - Government – Law and Policy
  - Private Sector – Delivery of services
  - NRA – Regulating the sector in accordance with the Law and sector policy
- **Independence, a three part test:**
  - Structural
    - No structural ties between the regulator and the operators/service providers
  - Financial
    - No financial links with the industry or the Ministry
  - Political
    - Implements rather than makes policy
- **A system of "checks and balances"**
- **Independence secures impartial regulation**

Empowering the Regulator

- **A regulatory authority cannot act without sufficient powers**
  - Power to obtain information
  - Power to amend licence conditions
  - Power to impose ex-ante regulations
  - Power to undertake ex-post investigations
  - Power to impose sanctions
- **The reference paper does not explicitly discuss the powers of the regulator**
  - *"Appropriate measures shall be maintained for the purpose of preventing suppliers...from engaging in anti-competitive practices"*
  - Punitive sanctions would deter and prevent suppliers from such a course of action.

Implementation Progress

- **The Hashemite Kingdom of Jordan was a pioneer in the Arab World**
  - The Telecommunications Regulatory Commission was created in 1995
  - The first independent sectoral regulator in the region
- **The Law and the TRC predates the Reference Paper**
  - The Telecommunications Law encompasses the principals of the reference paper
  - The TRC has implemented the Law and the provisions of the reference paper

Competition Safeguards

Reference Paper	Jordan's Progress
Appropriate Measures shall be maintained for the purposes of preventing suppliers...from engaging in or continuing anti-competitive practices	TRC has issued the Instructions on Competition Safeguards in the Telecommunications Sector – February 2006 These instructions are adopted and applied by the TRC and licensees in the analysis of competition in the telecommunications sector. They include ex ante and ex post provisions and serve to prevent anti-competitive behaviour

Interconnection

Reference Paper	Jordan's Progress
• *Interconnection to be assured* • *Public Availability of procedures* • *Transparency of arrangements* • *Dispute settlement*	TRC has issued the Interconnection Instructions – February 2006 These instructions are transparent and set out: •The requirements to provide interconnection •The procedures for negotiating interconnection •The requirements for a reference interconnection offer •The dispute resolution procedure and the role of the TRC in such procedure

Universal Services

Reference Paper	Jordan's Progress
Any member has the right to define the kind of universal service obligation it wishes to maintain....	TRC has issued the Universal Service Instructions – April 2006 These instructions set out: •The requirements to provide universal services •The procedures sharing the costs of provision

Licensing

Reference Paper	Jordan's Progress
Public Availability of Licensing Criteria	TRC has introduced the integrated licensing regime: •TRC grants individual and class licences. The former being used only when scarce resources are involved •Licensing criteria are publicly available. This provides certainty in the sector •We intend to simplify further the licensing procedures

Independent Regulator

Reference Paper	Jordan's Progress
The regulatory body is separate from, and not accountable to, any supplier of telecommunications services. The decisions of and the procedures used by regulators shall be impartial with respect to all market participants.	The TRC was established in 1995 as an independent regulator having responsibility for the telecommunications, information technology and postal sectors in Jordan. The TRC is independent of all operators and service providers. The TRC is answerable to the Prime Minister.

Scarce Resources

Reference Paper	Jordan's Progress
Procedures for the allocation and use of scarce resources, including frequencies, numbers and rights of way, will be carried out in an objective, timely, transparent and non-discriminatory manner.	The TRC has established fair, non-discriminatory, objective and transparent procedures for managing and allocating scare resources. Scarce resources are available to all on a "first come – first served basis", or through an auction process. This is a central theme of the TRC's integrated licensing regime.

Challenges

- **Regulation is a process and not an end state**
  - The TRC will continue to evolve the regulatory regime to match the developments in the market. As the market becomes more competitive the regulatory regime should be updated accordingly.
  - Move from ex ante to ex post intervention
- **Empowering the regulator**
  - The Reference Paper does not explicitly empower the regulator.
  - The Reference Paper is intended to facilitate international trade and not necessarily to set the standard for regulation.
  - To become an international standard for regulation, the Paper should explicitly address:
    - The Powers of the regulator
    - Protection of the consumer

Thank You

For further information on the TRC and the Jordanian Regulatory Regime please visit: www.trc.gov.jo

Nepal's Commitment on Telecommunication Services in the WTO

PRESENTED BY
Dr. Dinesh Kumar Sharma
Chairman
Nepal Telecommunications Authority

Presented at : Symposium on Telecommunications to Commemorate the 10th Anniversary of the Fourth Protocol to the GATS, 20-21 February 2008, Geneva, Switzerland

Nepal in WTO

May 1989- Nepal, formally applied for General Agreement on Tariffs and Trade (GATT) membership.

Sept 2003- Protocol of Accession of Nepal was adopted in the 5th WTO Ministerial Conference held at Cancun, Mexico.

April 2004- Nepal, formally ratified the WTO Membership and entered the WTO.

2

Liberalization of Telecom Sector in Nepal

- Telecom Act enacted in 1997 to make telecom service reliable and easily available throughout the country by involving private sector and to regularize and systematize telecom services.
- Nepal Telecom Authority (NTA) established as a regulatory body in accordance with Telecom Act, 1997.
- Telecom Policy 2004 formulated to fully liberalize the sector and open up the new opportunities to the private investors.

3

Nepal Commitment on Telecom Services in the WTO

- Telecom Services proposed by Nepal to WTO
  - Basic Telephone Service- *Partially Opened*
    - Local telephone service
    - Domestic telephone service
    - International telephone service
    - Telex service
    - Domestic and international telegraph services
  - Mobile Telephone Service- *Partially Opened*

4

Nepal Commitment on Telecom Services in the WTO (Contd.)

- Value Added Services- *Fully Opened*
  - Internet including e-mail
  - E-mail
  - Voice Mail
  - Video text
  - Fax Mail
  - VSAT
  - Audio Conference
  - Pay Phone
  - Pre-paid Calling Card
  - Local, Long Distance and International Data Communication
  - Radio Paging
  - Trunk Mobile.

5

Nepal Commitment on Telecom Services in the WTO (Contd.)

- Commitments
  - No limitation on number of service providers will exist by January 2009- *Committed*,
  - Foreign participation permitted through a joint venture with up to 80% equity participation- *Status on Next Slide*.

6

Status on Foreign Equity

- Basic Telephone Services
  - United Telecom Ltd.- Private Operator with 80% foreign equity of Indian Investors- http://www.utlnepal.com/
  - Nepal Satellite Telecom Ltd.- Private Operator with 80% foreign equity of Bangladeshi and Pakistani Investors- Prospective Operator.
- Mobile Telephone Services
  - Spice Nepal Pvt. Ltd.- Private GSM Operator with 80% foreign equity of Russian Investors- http://www.spicenepal.com/

7

Status on Foreign Equity (Contd.)

- Rural Telecommunications Service
  - STM Telecom Sanchar Pvt. Ltd.- Private Rural Operator with 80% foreign equity of American Investors- http://www.stmi.com/
  - Lal Sahu Distribution Pvt. Ltd.- Private Rural Operator with 80% foreign equity of Israeli Investors- Prospective Operator.

8

Nepal Commitment on Telecom Services in the WTO (Contd.)

- Additional Commitments as contained in the Telecommunication Reference Paper
  - Competitive safeguards,
  - Interconnection,
  - Universal service,
  - Public availability of licensing criteria,
  - Independent Regulators, and
  - Allocation and use of scarce resources.

9

Status on Competitive Safeguards

- Nepal Telecom is 85% government share holding public company having three separate Licenses i.e. Basic, Mobile and ISP,
- NT provides its backbone to its ISP without having financial agreement,
- There may be cross subsidy from ILD Telephone service to local phone service and may be from basic to ISP,
- Regulator is trying to take measures to prevent such anti-competitive practices,
- Some provisions are stipulated in Promotion of Market and Competition Act to forbid cross-subsidy.

10

Status on Interconnection

- Interconnection Rules still pending due to the lack of new Act/Regulations,
- Regulator already instructed the operators for publishing their Reference Interconnection Offer in this regard and in the process to comply.

11

Status on Universal Service

- Universal Service for Nepal is at least one Public Call Office within shouting distance (due to a very difficult terrain) of in any inhabitants is defined by the Telecommunication Policy 2004,
- NTA collects annually 2% Rural Telecom Development Fee (RTDF) from all licensees in their total adjusted gross revenue,
- RTDF would be utilised to install such PCOs in Rural areas,
- Every Basic telecom operator must invests 15% of their total investment to expand their network outside the urban areas.

12

Status on Public Availability of Licensing Criteria

- NTA has maintain the website to give information in this regards at http://www.nta.gov.np/index.html
- Licensing Criteria available for the Value Added Services on the Guidelines; also, available on the website of NTA.

13

Status on Independent Regulator

- NTA is fully independent in terms of financial and functional. But, appointment of all of the Members including Chairperson is through Government and NTA Board is accountable to the Government.

14

Status on Allocation & Use of Scarce Resources

- Use of Radio Frequency is governed by Radio Act and Regulation. After allocation of Spectrum NTA assigns to the operators,
- Use of Numbering is as decided by the NTA,
- Use of Right of Way is dependent on the Government's policy and availability.

15

Difficulties in fulfilling all the Commitments in General

- Delays in implementation of the Telecom policy, 2004, due to the lack of proper legislations such as Act and Regulations -*Telecom First Amendment Bill is under discussion in the Cabinet,*
- New Licensing Regime, Tariff and Interconnection Rules still pending due to the lack of new Act/Regulations,

16

Difficulties in fulfilling all the Commitments in General (Contd.)

- Court Cases on licensing, opening up of new services and the use of technology,
- Delays in developing Universal Fund Disbursement Guidelines as well as the Fund Disbursement & Management Committee,
- Delays in providing interconnection facilities to the new Service Providers.

17

THANK YOU!

Contact Address:
Nepal Telecommunications Authority
Tripureswor, Kathmandu, Nepal
Email: ntra@nta.gov.np
Tel: (977)14101030-38
http://www.nta.gov.np

Challenges, Approach and Achievements

A decade's Retrospection of Telecommunications in the Separate Customs Territory of

Taiwan, Penghu, Kinmen and Matsu

Mr. Po-Chou Liang
Senior Engineer, NCC

BTA Symposium, 20-21 February 2008, Geneva, Switzerland

Telecoms of Taiwan, Penghu, Kinmen and Matsu

Outline

- **First Reform (1996 - 2001)** – *From Monopoly to Competition*
  - Objectives
  - Challenges
  - Approach
  - Achievements
- **Second Reform (2002 – Present)** – *Creating a Competent Regulator*
  - Objectives
  - Challenges
  - Approach
  - Achievements
- **Conclusion**

First Reform (1/4)

Why?

- To Create a Liberalized and Competitive Telecom Market
- To Plan for Access to WTO

Objectives:

- WTO Accession

First Reform (2/4)

Challenges:

- Proceeding from Monopoly to Competition
- Establishing an Independent Regulator
- Implementing Pro-competitive Regulatory Measures

  Guiding principles: Fundamental spirit and rules of WTO
  Liberalization to strengthen competitiveness

First Reform (3/4)

Approach:

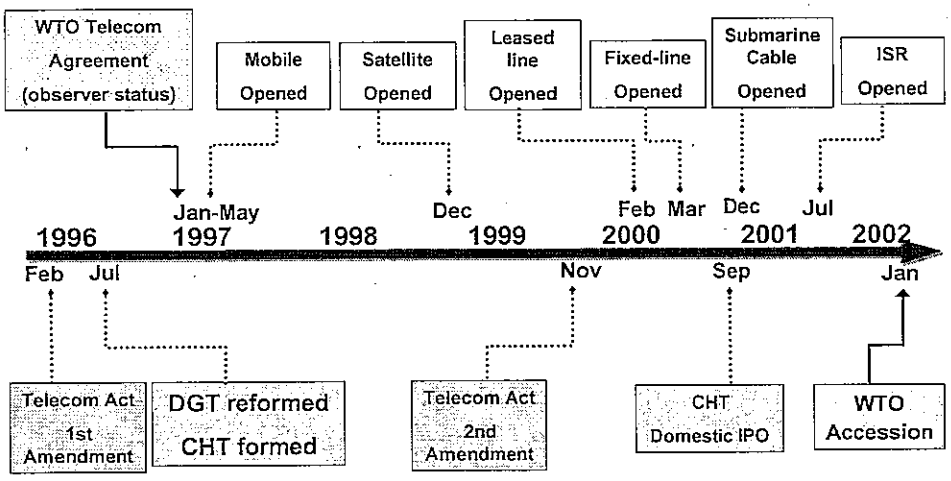
- Learned from peer regulators worldwide
- Adopted phased approach for liberalization

Achievements:

- Overhaul of the Telecommunications Act – Feb 1996
  - ⇨ *Several Amendments were made subsequently*
- Establishment of the independent regulator, DGT – Jul 1996
- Enactment of regulations for network interconnection – Oct 1997
- Enactment of regulations for governing tariffs – Sep 2000
- Enactment of regulations on universal services – Jun 2001

DGT : Directorate General of Telecommunications

First Reform Milestones 1996 - 2001



First Reform (4/4)

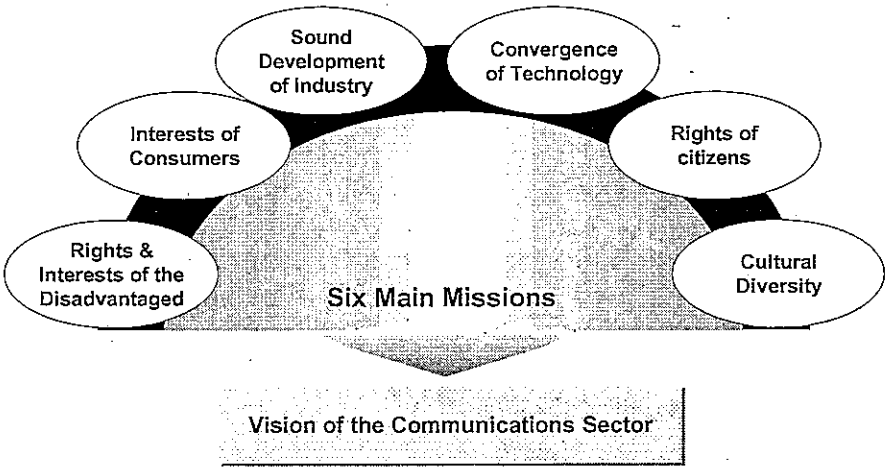
Second Reform (1/10)

Why?

- To establish a more effective and restructured *independent* regulator to ensure impartiality and accommodate the trend of *convergence* between telecommunications and broadcasting

Second Reform (2/10)

Objective: to establish a Competent Regulator



Second Reform (3/10)

Challenges:

- *Converging laws and regulations*
  - ⇨ *The outmoded regulatory framework:*
  - ➢ *The authorities for telecommunications and broadcasting affairs originally belonged to different departments and were governed by different laws*
  - ➢ *This led to a lack of consistency and efficiency in management for regulators*

Second Reform (4/10)

Approach:

- *To establish a converged independent regulator*
  - ⇨ *To effectively carry out regulatory affairs concerning communications*
  - ⇨ *To independently exercise its duties and powers in accordance with the laws*

Achievement:

- *The NCC became operational on February 22, 2006*
  - ⇨ *Laws and regulations dealing with communications came under the official responsibility of the NCC*
  - ⇨ *The corresponding powers originally under the MOTC, GIO, and DGT were transferred to the NCC*

MOTC: Ministry of Transportation and Communication *DGT: Directorate General of Telecommunications*
GIO: Government Information Office

Second Reform (5/10)

The NCC' s Challenge 1:

- *Ensuring its operations can better address the six areas covered by the WTO Telecom Reference Paper:*
  - ⇨ *Competitive Safeguards*
  - ⇨ *Interconnection*
  - ⇨ *Universal Service*
  - ⇨ *Public Availability of Licensing Criteria*
  - ⇨ *Independent Regulators*
  - ⇨ *Transparent and Objective Allocation and Use of Scarce Resources*

Second Reform (6/10)

The NCC' s Challenge 2:

- *Amending relevant laws and regulations in a transparent and consistent manner*
  - ⇨ *Policies & regulations need amending*
  - ⇨ *Approximately 10 Acts and dozens of regulations and directions need amending*
  - ⇨ *The alteration of regulation framework may affect the rights and interests of operators*
  - ⇨ *A change of traditional perspective is required*

Second Reform (7/10)

The NCC' s Approach :

- *Act according to decisions made by a collegial system*
- *Make best use of multi-level regulation*
  - ⇨ *Self-regulation, Co-regulation, Regulation*
- *Set 3 stages for Convergence*
  1. *Abolish or revise unnecessary regulatory legislation*
  2. *Respond to urgent industry needs, complete revision of laws on small scale*
  3. *Respond to the needs of digital convergence, complete a comprehensive revision of the Telecommunications Act and the three radio and television laws*

Second Reform (8/10)

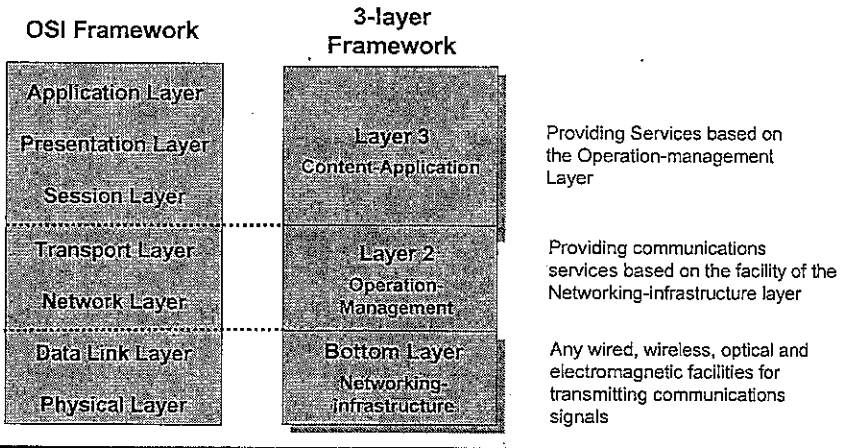
- *The NCC' s Approach: the Transparent* Policy Planning System

Input	Method
Internal	Hold Discussions among Sub-Groups within the Commission.
External	Conduct Public Consultation, Public Opinion Survey.
International	Refer to International Benchmarks

Second Reform (9/10)

The NCC' s Achievements:

- *Communications Management Bill was drafted for future 3-layer Regulation Framework*

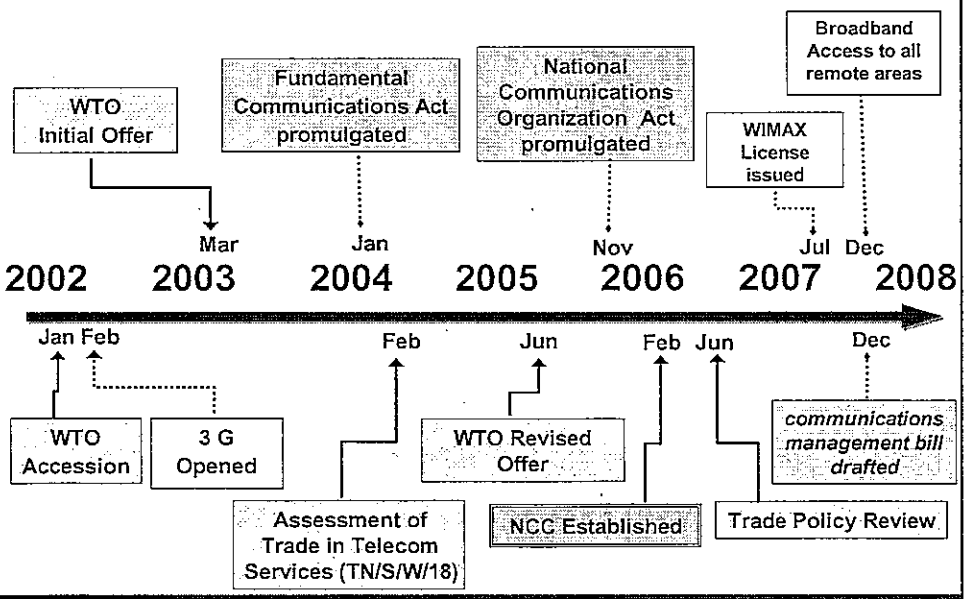


Second Reform (10/10)

The NCC' s Challenges:

- ***Managing emerging telecom technologies and services sensibly***
  - ⇨ *Continually evolving services require updating knowledge and awareness*
  - ⇨ *Much effort and increased budget and authorization are required*
- ***Easing restrictions on telecom equipment imports and cross-certification agreements***
  - ⇨ *Requires greater international cooperation*
  - ⇨ *Calls for a multilateral or plural agreement on both conformity assessment procedures and common criteria recognition for electronics and IT products*
- ***Providing Broadband Access to every rural community***
  - ⇨ *This goal was recently achieved in Jan. 2008*

Second Reform Milestones 2002 - present



The Effects of Liberalization

Item	Category	1997	Sep 2003	Nov 2007
Operators	Type I (facilities-based)	1	95	97
	Type II	80	436	557
Subscribers (Millions)	Local Phone	10.86	13.29	13.31
	Mobile Phone	1.49	25.28	24.15
	Internet (users)	1.66	8.77	14.76*
	Broadband Internet	...	2.72	4.62
Penetration	Local Phone	49.96%	58.86%	58.02%
	Mobile Phone	6.86%	111.97%	105.26%
	Internet (pop)	8.00%	39.00%	64.4%*
	Broadband/Internet	...	30.96%	70.19%
Total Revenues	NT$ Billions	176.2	333.7 (2002)	371.6 (2006)
	Fixed Network Telephony	74%	26%	20%
	Mobile Phone	22%	56%	56%
	Data	4%	18%	24%
Average Price of IDD per minute (NT$)		29.94	6.22 (Nov 2003)	5.28 (Sep 2007)

Main source: NCC

** Source: www.find.org.tw*

Conclusion

- Liberalization involves short-term pain, but long-term benefit.
- The NCC's 3C: *Convergence, Competition, Consumer protection have been instrumental*
  - ⇨ *Regulations should be constantly reviewed* to adapt to the development of market, needs of consumers and innovation of technologies
  - ⇨ A mechanism under *long-term strategy for safeguarding competition* is essential
  - ⇨ The regulator should consider *public opinions* and *international benchmarks*, and hold periodic *talks with stakeholders*
- The Removal of Technical Barriers to Trade (TBT) on the issues of *conformity assessment procedures* and *common criteria recognition* for ICT products under the multilateral negotiations is necessary

Thank you for Your Attention

LESSONS FROM IMPLEMENTATION OF MARKET REFORM AND COMPETITION

Ernest C. Ndukwe
Chief Executive Officer
Nigerian Communications Commission,
WTO Telecom Symposium,
Geneva,
20th & 21st of February 2008.

- To be successful, the Regulator's function should be based on a well defined set of objectives which typically would include:
- Attracting investment,
- infrastructure planning and development,
- sector efficiency improvement,
- quality of service improvement,
- encouragement of competition,
- eliminating barriers to market entry for new operators,
- protection and empowerment of the consumers and promotion of the general socio-economic well being

NIGERIAN COMMUNICATIONS COMMISSION

- Without adequate funding a regulatory body cannot be effective. Some NRA's are starved of basic funds essential for operational effectiveness, training and manpower development.
- The NRA must be well funded and financially strong to be effective.
- NRA's must be operationally and financially independent of network operators and service providers and must never depend on such entities for favors or handouts.

NIGERIAN COMMUNICATIONS COMMISSION

- Licensing criteria must be well articulated and publicly available.
- Terms and conditions of individual licenses must be investor friendly and also ensure consumer rights.
- Licensing Processes must be transparent and timely.
- Exclusivity, where considered necessary, must be for a determined optimum number of operators and must ensure adequate competition and availability of choice.
- Anticipation and Prevention of anti-competitive conduct by dominant operators is crucial.

- The regulatory environment should be such that new entrants are guaranteed seamless interconnection with the incumbents and dominant operators.
- Regulatory institutions must be strong enough to be able to enforce interconnection.
- Interconnection must be on non-discriminatory basis with respect to technical standard and specifications, rates and quality.
- Interconnection must be assured on a timely, transparent and reasonable manner;
- Interconnecting parties must have access to quick and independent dispute resolution process.

- ICT equipment and systems are highly capital intensive. Duty rates for a developing country, therefore, must be such that will encourage fast roll out of networks and services that are generally affordable.
- Countries with high import duty regimes should therefore review such duty rates on ICT goods.
- Government should depend on other sources of revenue such as company tax, value added tax and other taxes rather than import duty on equipment that could limit rate of expansion of ICT infrastructure.
- Simplification of procedures for importation of ICT equipment and development of related software is essential.
- Granting of incentives such as pioneer status to qualified investors **especially those involved in local manufacture or local software development** is desirable.

INVESTOR EXPECTATIONS

- Most major investors around the world especially financial institutions take the independence of the National Regulatory Authority very seriously because it is seen as a guarantee for regulatory transparency and consistency.
- Technology Neutrality and level playing ground for all Operators must be maintained.
- Allocation of scarce resources such as frequency, numbering plan and rights of way must be objective, timely, transparent and non-discriminatory.
- NRA must be fair and firm in the enforcement of rules and regulations.

HUMAN CAPACITY

- There must be conscious effort made towards skills development intervention through training and re-training of technical and managerial personnel of the NRA.
- Also for the sector generally, the expansion of a nation's telecommunications facilities must go side by side with a plan for the development of the human resource skills to support the industry.
- Establishment of national or regional training institutions is therefore essential.

- Establishing a good investment climate ultimately provides the platform for attraction skilled manpower as well as repatriation of the knowledge and expertise of indigenous ICT professionals who are excelling overseas.

Critical success factors for implementing market reform include:

- A well articulated National Sector Policy for market liberalization and competition
- Government unwavering commitment to reform at the highest level
- Enactment of good Enabling Laws, regulations and guidelines
- The establishment of strong, well funded and independent National Regulatory Authority.

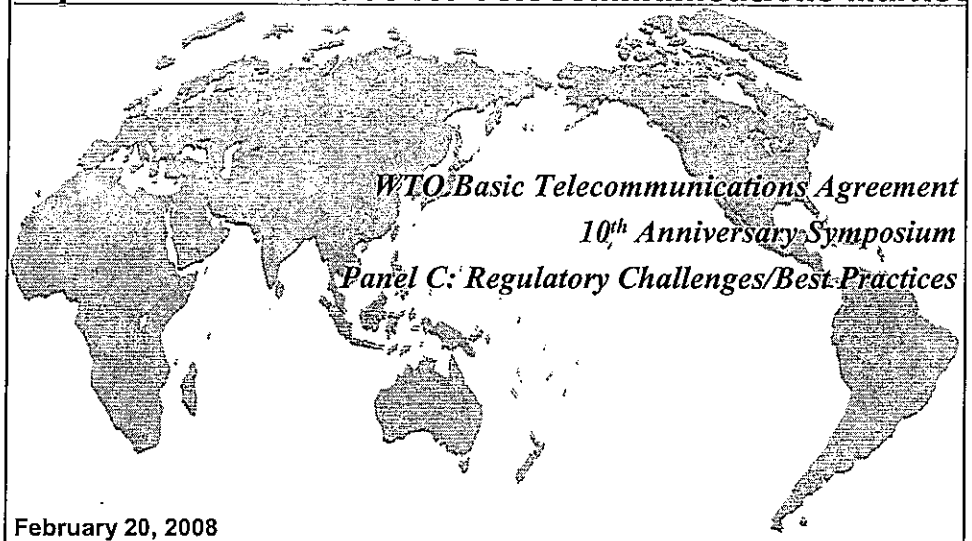
NIGERIAN COMMUNICATIONS COMMISSION

THANKS

ecndukwe@ncc.gov.ng

NIGERIAN COMMUNICATIONS

Japan's Best Practice for Telecommunications Market

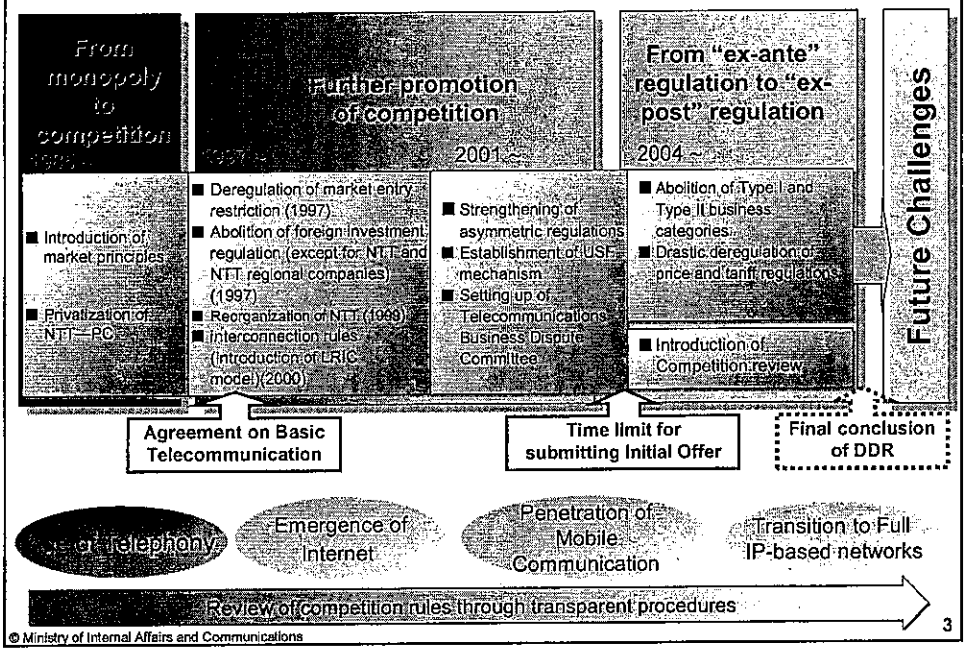


WTO Basic Telecommunications Agreement
10th Anniversary Symposium
Panel C: Regulatory Challenges/Best Practices

February 20, 2008
Shun SAKURAI
Director-General for Policy Coordination
Ministry of Internal Affairs and Communications (MIC), JAPAN

Contents

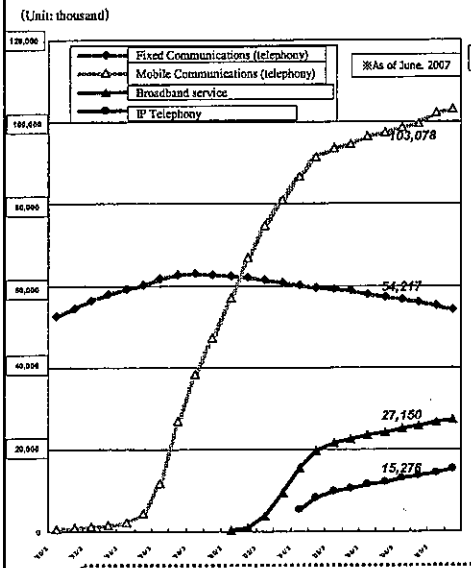
Outline of Japanese Telecom Competition Policy



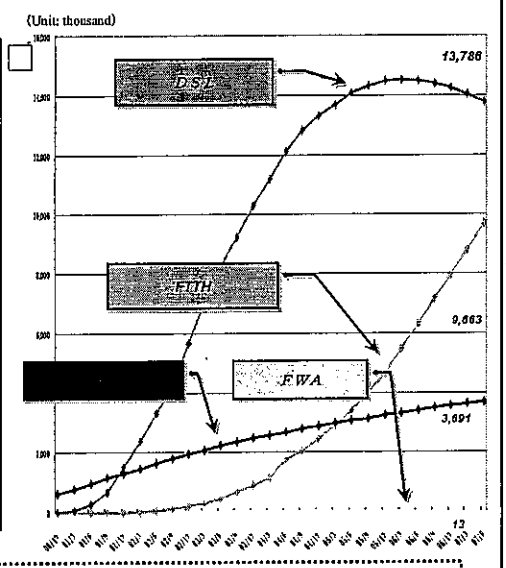
3

The Number of Japan's service subscribers

【Telecommunication Service Users】



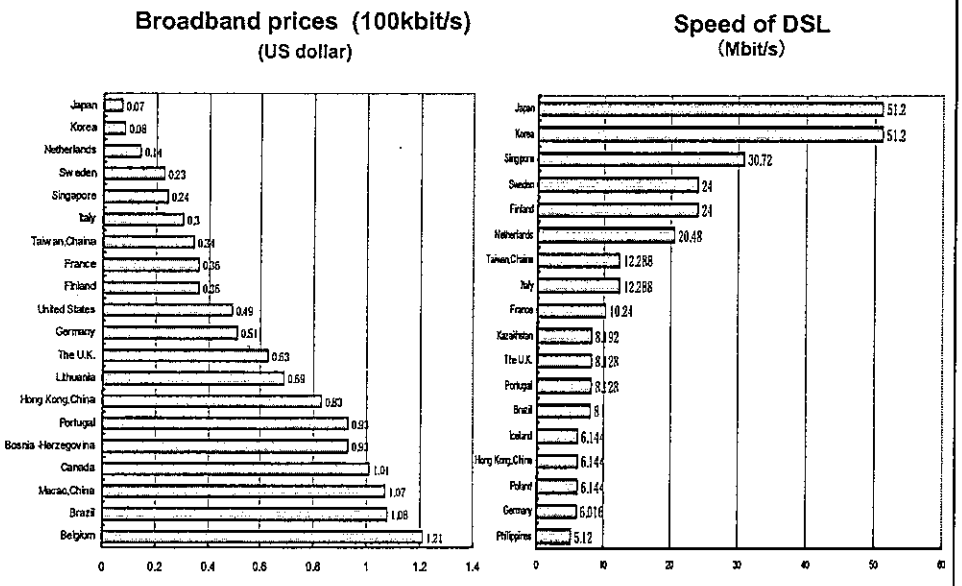
【Number of Broadband Service Users】



Population: 127,053 Households: 51,713 (As of March, 2003 / Thousand)

4

Japanese Broadband Service in Global Comparison



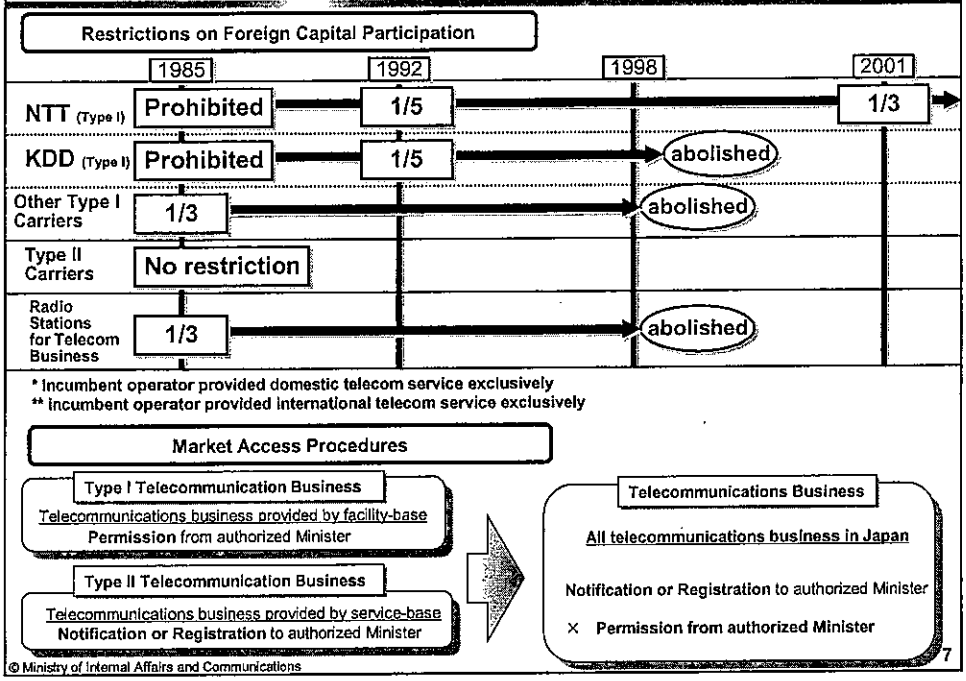
Source : ITU Internet Reports 2006 " digital.life" (December 2006)

5

Development of Regulatory Framework

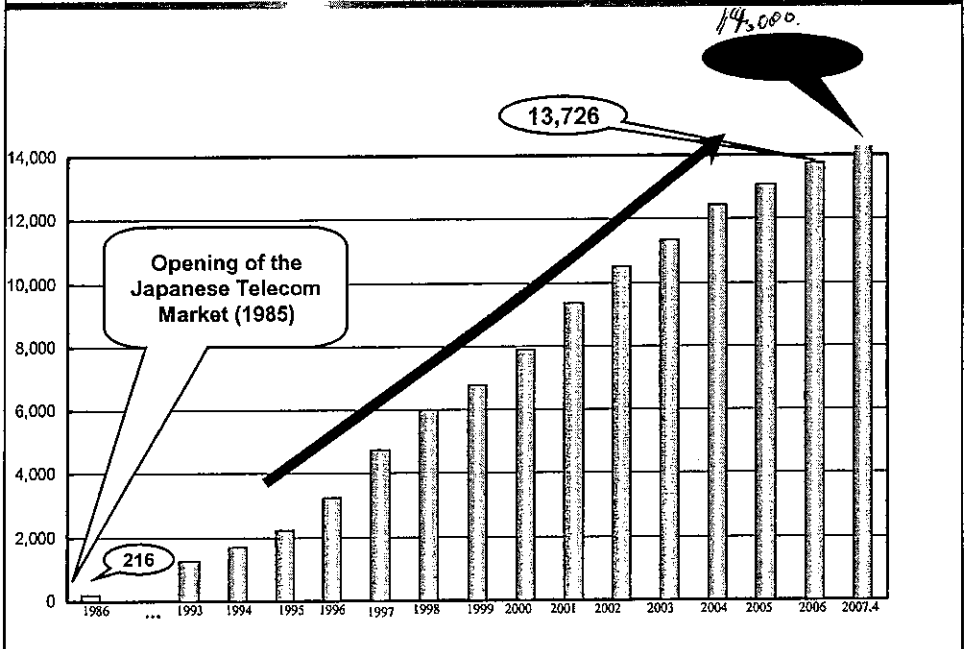
(1) Deregulations on Market Access

Deregulations on Japanese Telecommunications Market



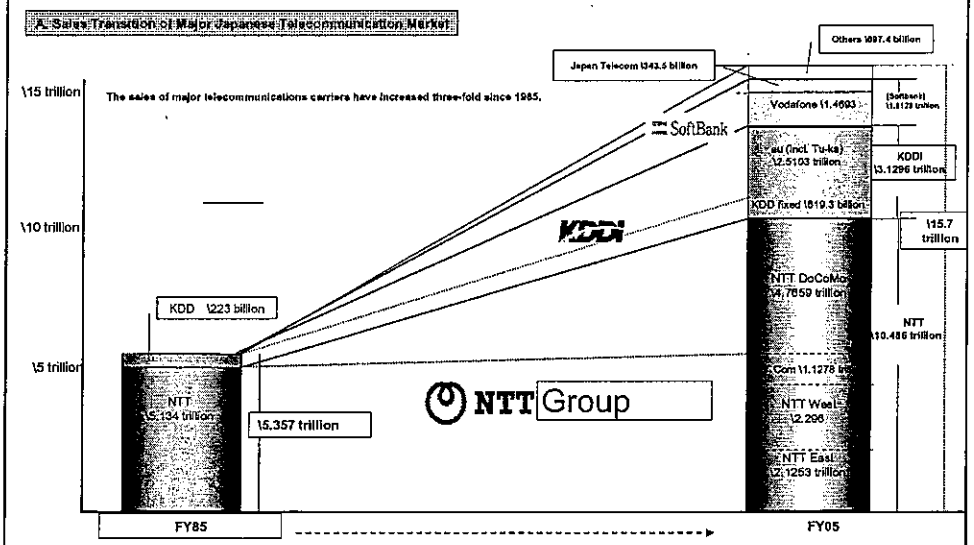
7

The number of Competitive Carriers



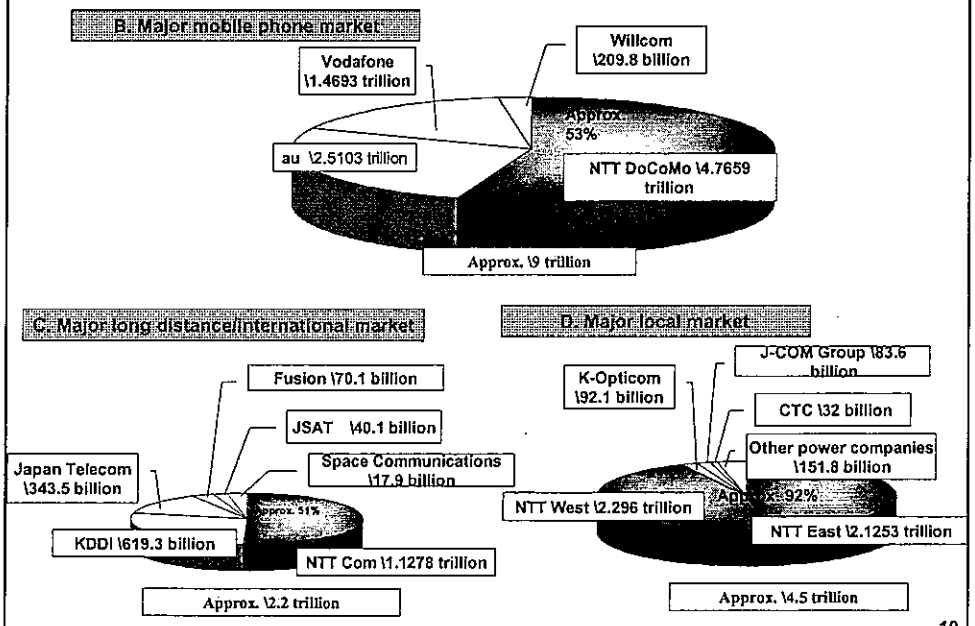
8

Japan's Telecom Market (FY 2005) overall



Note 1: The above diagram is created from the financial statements (total sales revenue) based on accounting regulations for telecommunication carriers submitted by carriers that provide basic telecommunication services and the financial reports based on the accounting regulations for telecommunication operations submitted by certified telecommunications carriers (the total sales profits of telecommunication businesses and other operations except for TEPCO showing only the sales profits for their telecommunication operations).
Note 2: The sales of NTT DoCoMo and the sales of KDDI fixed and each category of au were created by settlement short lines.

Japan's Telecom Market (FY 2005) segment



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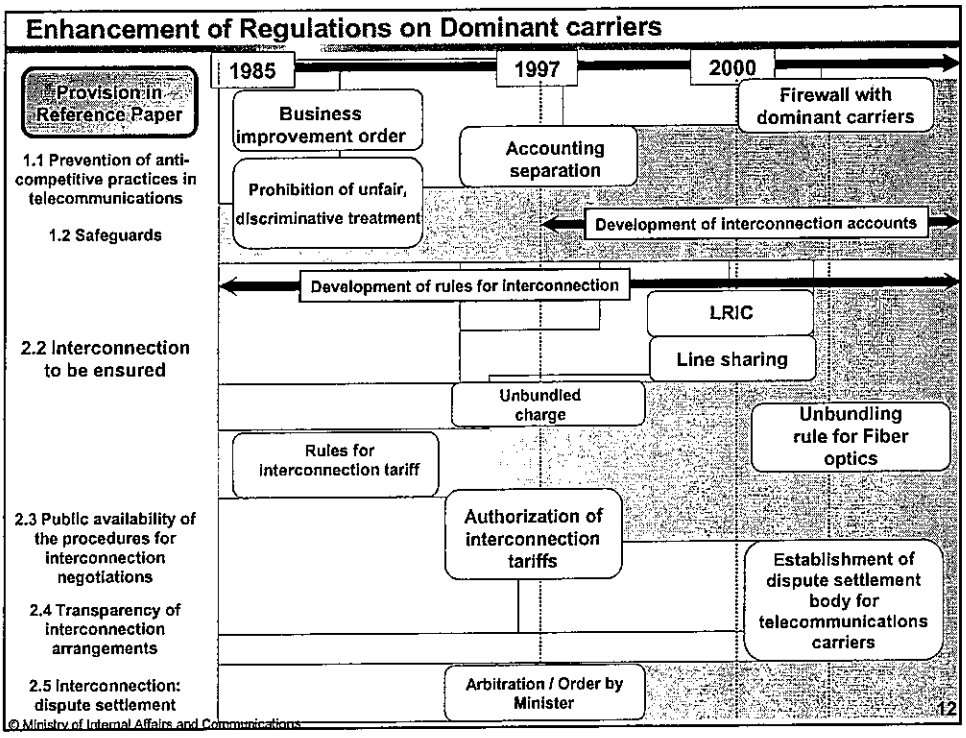
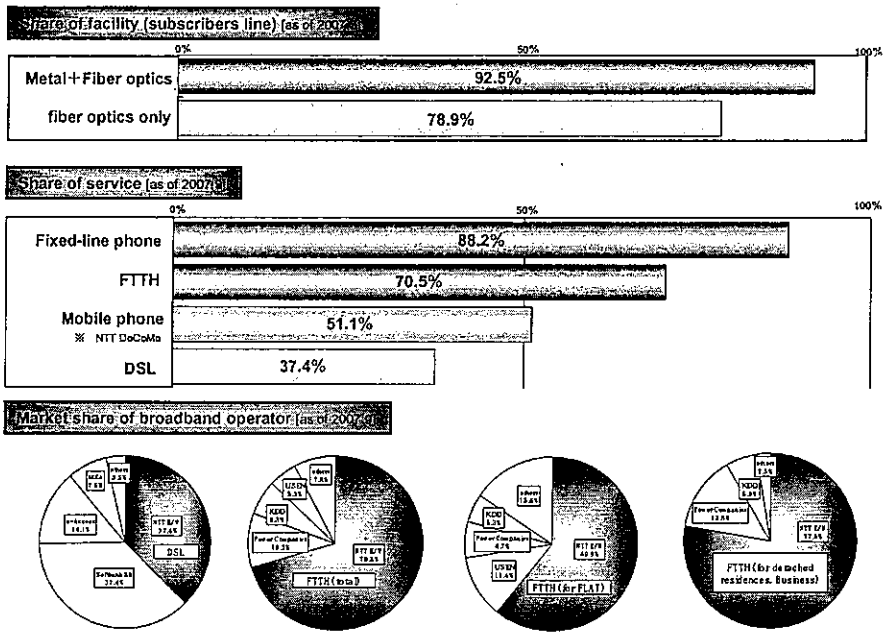
Deregulations in Japanese Telecommunications Market

(2) Asymmetric Regulations on Dominant Carrier

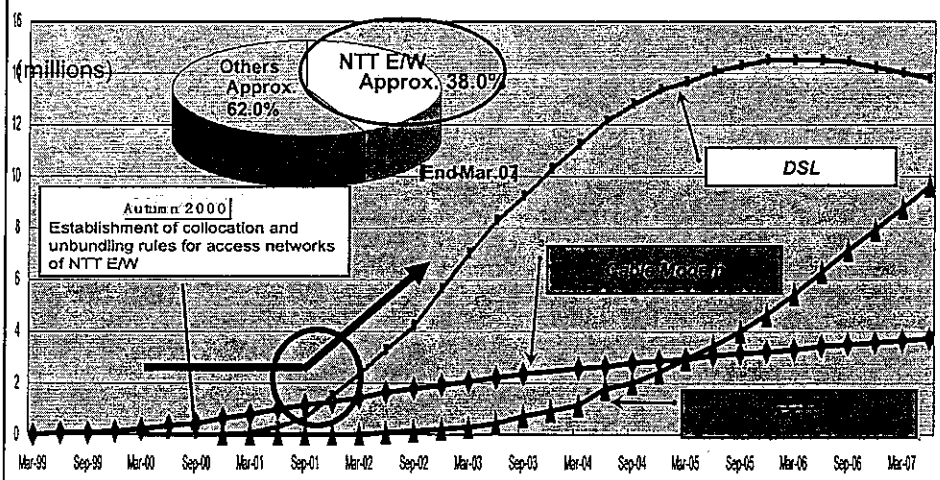


NTT's Market Share



13

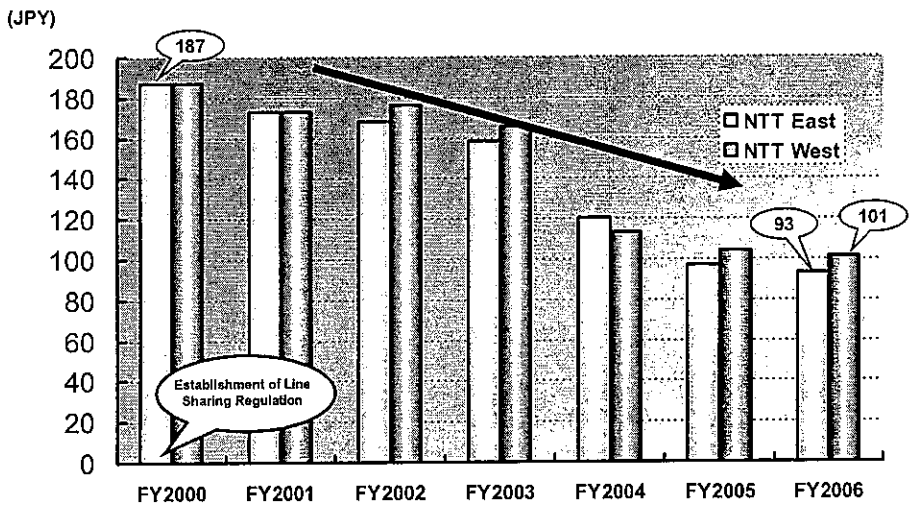
The Era of Broadband -Development of DSL service-



- ○ Unbundling rules are stipulated by detailed function and facility. **e.g. Metal subscriber line, Optical subscriber line...**
  - >> Unbundling regulation on Access line has provided further opportunity of non-facility based supplier to enter telecom market.
- ○ At the same time, the provision of collocation rule has been established.
  - >> Service suppliers who want to interconnect with major supplier can set up their facilities in the major supplier's building

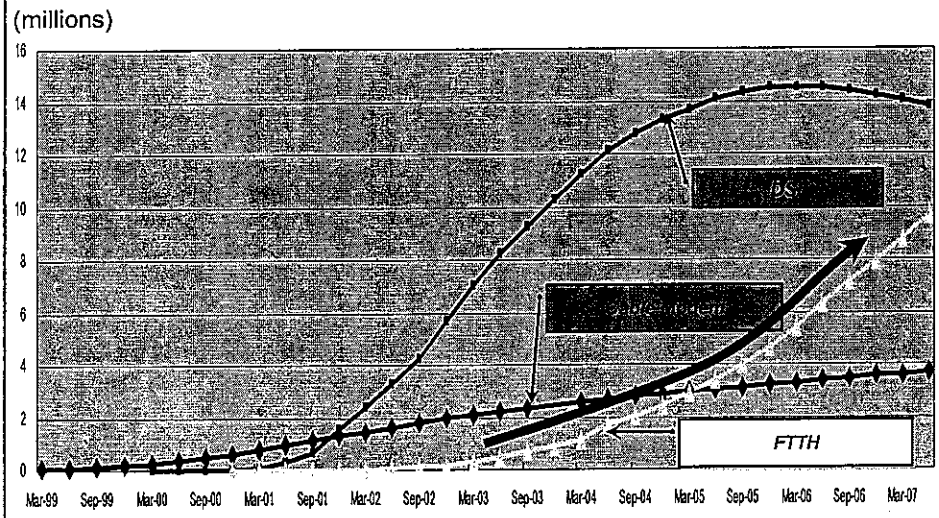
14

Access Charge for Line sharing of DSL



15

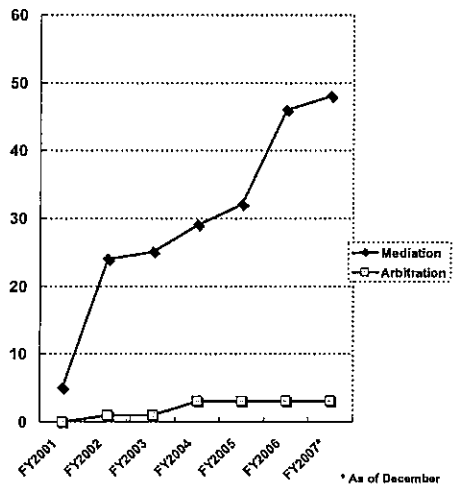
The Era of Broadband -Development of FTTH service-



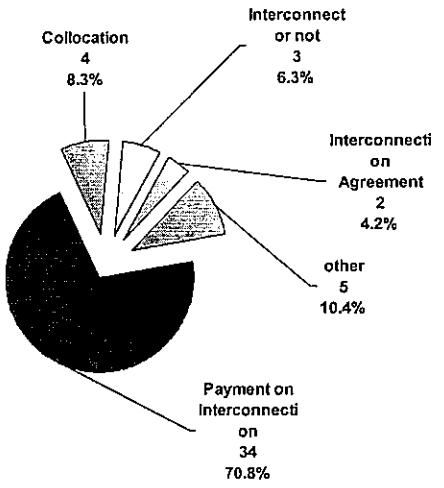
16

The Telecommunications Business Dispute Settlement Commission

Total Number of Mediation and Arbitration



Number of Mediation by Case



17

Future Challenges

New Competition Promotion Program 2010

Comprehensive Review of Competition Rules to Address the Transition to IP Based Networks (Comprehensively implemented by early 2010s)

- 1.Promotion of Facility Competition
- 2.Review of Interconnection Policies
  - Review of Designated Telecommunications Facilities System
  - Review of Calculation Method for Interconnection Charges of NTT East and West
    - Review of Calculation Method for Calculating Interconnection Charge of PSTN (concluded in 2007)
    - Review of Calculation Method for Interconnection Charges for Fiber Optic Networks (dealt with after the submittal of an application by NTT East and West)
  - Calculation method for interconnection charges in relation to next-generation networks
- 3.Review of Universal Service System
- 4.Review of Tariff Policies
- 5.Other Main Policies

19

Basic Framework for Network Neutrality

[redacted]

(1) IP-based networks should be accessible to users and easy to use, allowing ready access to content and application layers.
(2) IP-based networks should be accessible and available to any terminal that meets the relevant technical standards, and should support terminal-to-terminal (or "end-to-end") communication.
(3) Users should be provided with equality of access to telecommunications and platform layers at a reasonable price.

Note: In this case, "the user" refers not just to end users but also includes content providers and other related companies that conduct business using IP networks.

[redacted]

Equal access to networks

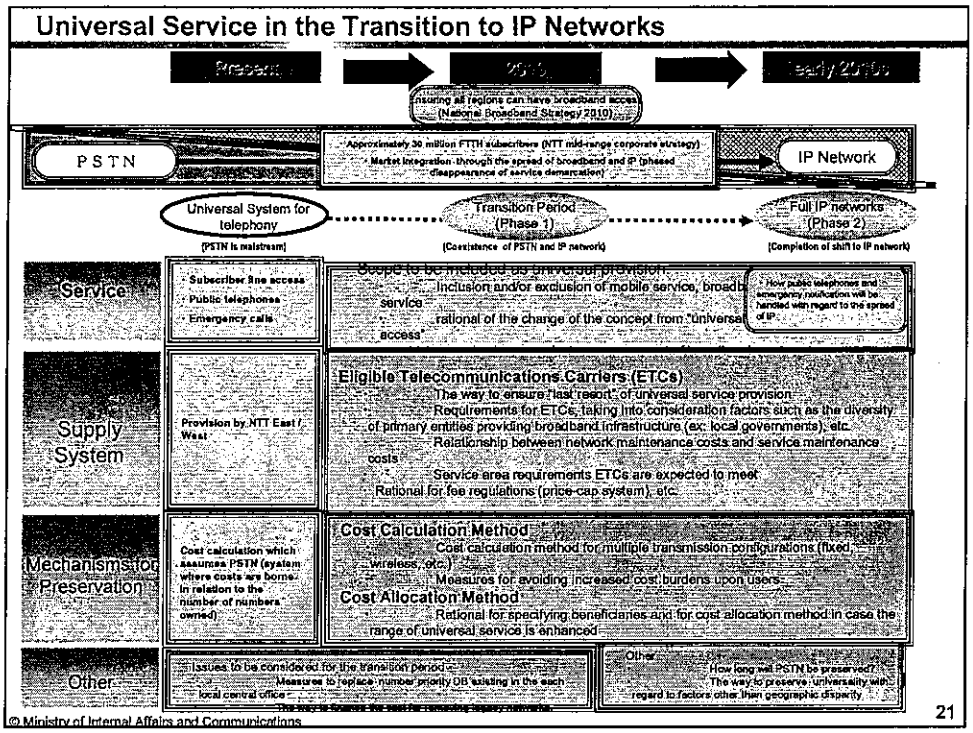
Neutrality of telecommunications layer with respect to other layers

Equitable cost distribution of networks

Neutrality of cost sharing models for upgrading the communications networks

[redacted]

20



Thank you.

s-sakura@soumu.go.jp

Liberalisation and Growth in Telecommunications - Hong Kong, China's Experience

T F So, Assistant Director
Office of the Telecommunications Authority
Hong Kong, China

OFTA
通訊管理局

Agenda

- Key Milestones in Liberalisation
  - Independent Regulator
  - Local Fixed Network
  - External Fixed Network
  - Mobile Network
  - Internet Access Service
- Liberalisation Benefited HKC's economy

Background Information about Hong Kong, China

- Special Administrative Region of the People's Republic of China
- Area 1,100 sq km
- Population 6.909 million
- Number of Households 2.237million
- Gross Domestic Product per capita in 2006 – US$ 27,000
- Services constitute about 91% of economy

Key Telecom Statistics

Telephone line density	56% by population
Number of local fixed operators	10
Broadband penetration	75% by households
Mobile penetration	143.4%
Number of mobile operators	5 (four 3G operators)
2.5G/3G customers as a percentage of mobile customers	26
Public Wi-Fi access points	5288
Annual revenue	US$ 6.6 billion (2007)
Annual capital expenditure	US$ 0.8 billion (2007)

Independent Regulator

- Legal basis – Telecommunications Ordinance
- Telecommunications Authority (TA) – Independent regulator empowered by the Ordinance to regulate the telecommunications industry
- 1993
  - Office of the Telecommunications Authority (OFTA) established as the executive arm of the TA
  - paved the way for liberalisation

Liberalisation in Local Fixed Network and Service

1995

- End of domestic telecommunications franchise
- Three new companies licensed
  - New World Telephone Limited
  - New T&T Hong Kong Limited
  - Hutchison Communications Limited

  to compete with the incumbent operator, Hong Kong Telephone Company
- Interconnection rules established

Liberalisation in Local Fixed Network and Service

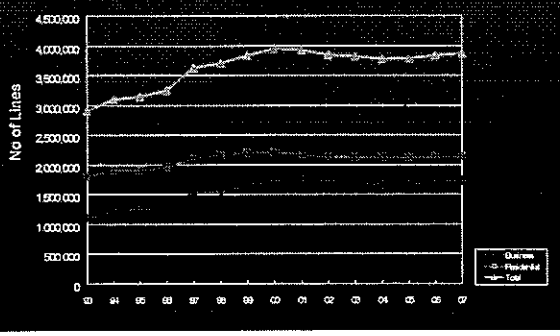
1997
- Fixed number portability introduced

2000 – further liberalisation
- 5 wireless local fixed networks licensed
- Cable TV operator allowed to provide telephone services

Liberalisation in Local Fixed Network and Service

2003 – fully liberalised
- No limit on number of licences
- Technology neutral
- No restriction on foreign ownership
- Services fully privatised, no government subsidy
- No control on tariffs
- Competition provisions introduced
- Market driven, pro-competition, pro-consumer policy

Telephone Lines

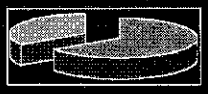


True Competition Developed in Market

Market Share of incumbent in 2006 -2007

Business lines 69.4%

Residential lines 65.9%



Incumbent
new entrants

Liberalisation of External Network and Service

- Hong Kong Telecommunication International (HKTI) held an exclusive licence for external services in 1990's
- In 1998, HKTI received HK$6.7 billion cash compensation from the government to surrender its exclusive licence, eight years earlier than the scheduled expiry in 2006

Liberalisation of External Network and Service

1999

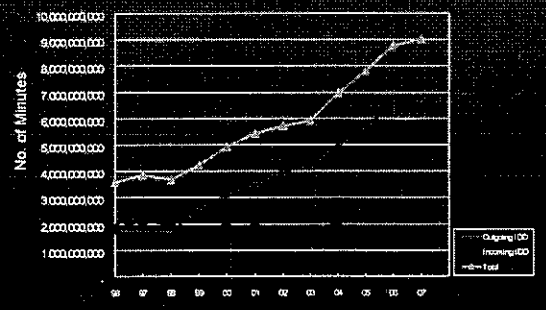
- External service-based competition introduced

2000

- External facilities-based competition introduced

  - New Technologies lowered operating cost
  - Substantial reduction in IDD tariffs
  - No limit on number of operators
  - Mandatory interconnection between external and local fixed networks

IDD Traffic



IDD Tariffs

- Liberalisation of external fixed networks/services brought about substantial reduction in IDD tariffs
- In 1999 – 2002 (4 years) alone, estimated consumer saving reached HK$ 25.5 billion (much higher than the compensation granted to the incumbent operator)
- International private leased circuits price also dropped substantially (eg. in 2001, price of IPLC for US/HK dropped by 50%)

Liberalisation in Mobile Network and Services

1984
- First mobile network introduced

1985 – 1989
- Four analogue licences issued, later switched to GSM 900 and CDMA

1996
- Additional 6 licences issued to provide GSM-1800

1999
- Mobile number portability implemented, triggered acute market competition

Liberalisation in Mobile Network and Services

2001
- Four 3G licensed issued through spectrum auctioning; First MVNO licence issued

2007
- One additional licence for CDMA 2000 issued

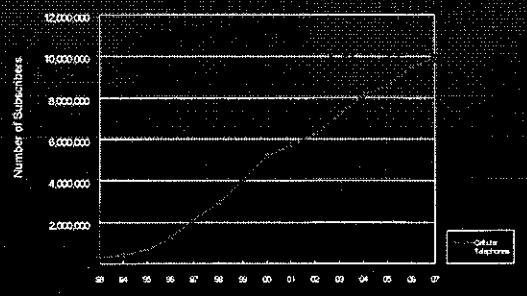
Now
- 152% subscriber penetration rate

Near future
- Several licences for broadband wireless access to be issued through spectrum auctioning

Liberalisation in Mobile Network and Services

- All liberalisation policies for fixed network apply
- Natural limitation on number of licensees due to limited availability of spectrum
- Spectrum auction - to ensure open, fair and efficient use of spectrum
- Spectrum trading to be considered

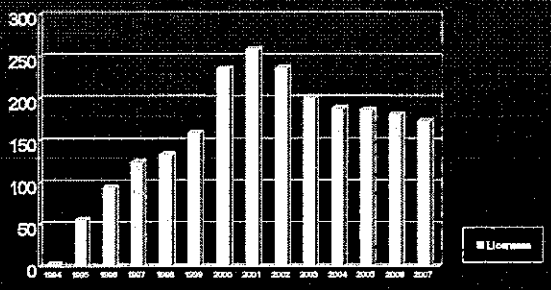
Cellular Telephones



Internet Access Service

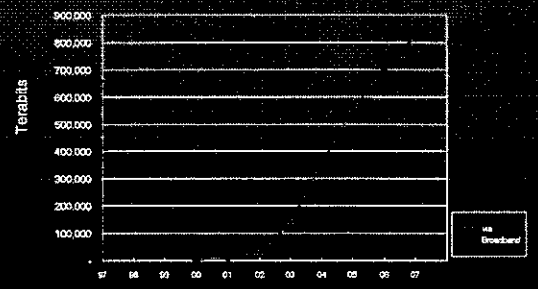
- Open to full competition since launched in 1990's
- No/Low market entry barrier
- Low licence fee (HK $750 per year)
- Light-handed regulations

Number of Licensed Internet Service Providers



Internet Traffic Volume

(Customer Access via Broadband Networks)



All Sectors Now Open to Competition

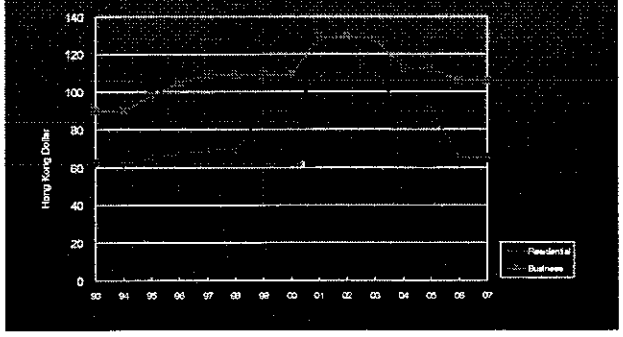
- Paging services – since 1970's
- Value-added services – 1985
- Mobile phone networks and services – 1985
- Local fixed networks and services – 1995
- External services – 1999
- External facilities – 2000

	2002	2003	2004	2005	2006	2007
Wireline-based fixed carriers	7	9	9	10	10	10
Wireless-based fixed carriers	2	2	1	1	1	1
Satellite-based external fixed carriers	5	4	5	6	6	6
Cable-based external fixed carriers	18	18	19	20	21	24
External telecom services operators	213	217	230	226	248	252

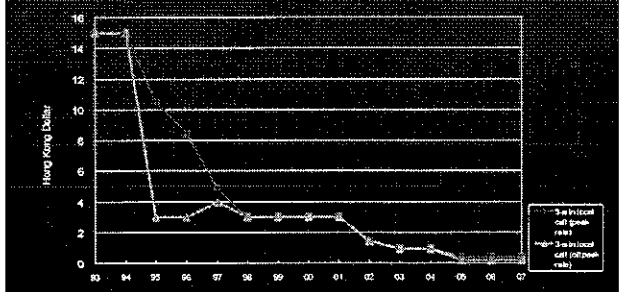
Liberalisation Benefited HKC's Economy

- Consolidated Hong Kong's position as a telecommunications hub in the Asia-Pacific Region
- High quality, low price services enhanced competitive advantages of other sectors
- Reduced cost of telecommunications to business and residential consumers
- Competition drove service innovation, which in turn enhanced productivity (increase in capacity, decrease in unit cost)
- Facilitated the rollout of information infrastructure in Hong Kong

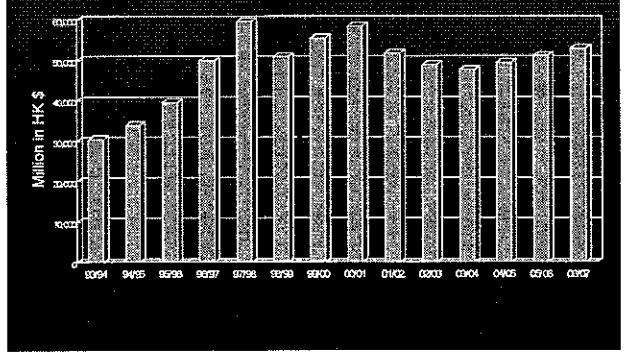
Fixed Line Tariffs
Monthly subscription



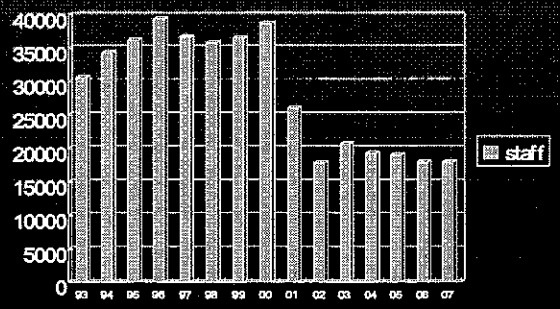
Mobile Services Tariffs (Pre-paid)
Local call (peak vs off-peak rate)



Total Telecom Services Revenue



Full-time telecommunication staff



GDP and Services contribution

US$

Service contribution :

Year	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
%	82.3	84.2	84.7	85.2	85.9	85.7	86.1	86.5	87.3	88.3	89.2	89.9	90.4	91.3	91.3

Thank you

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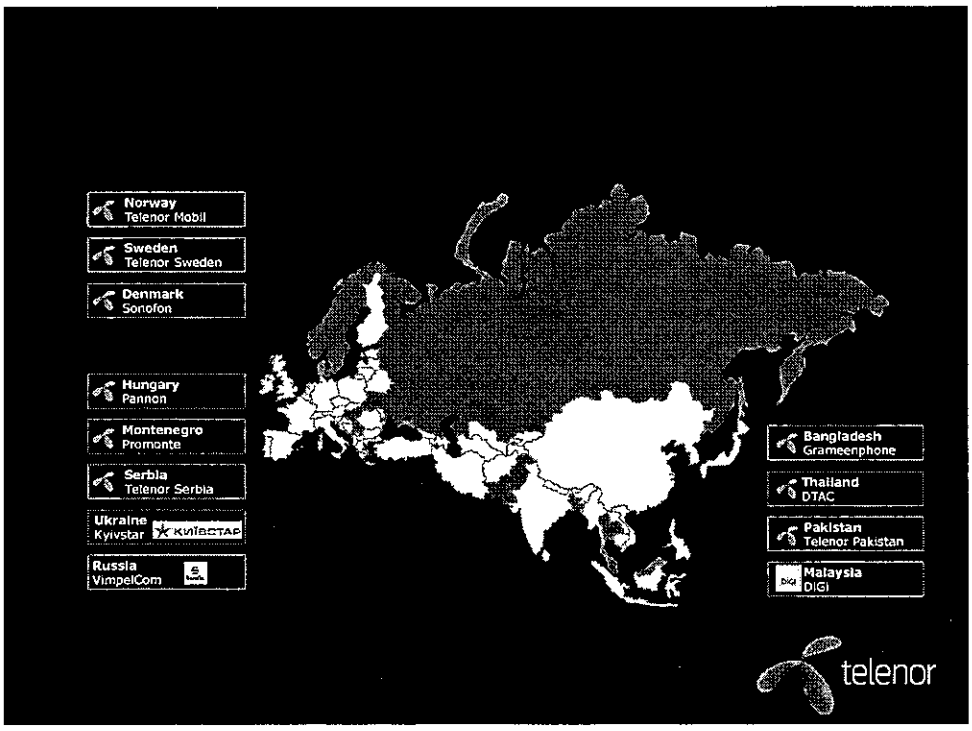
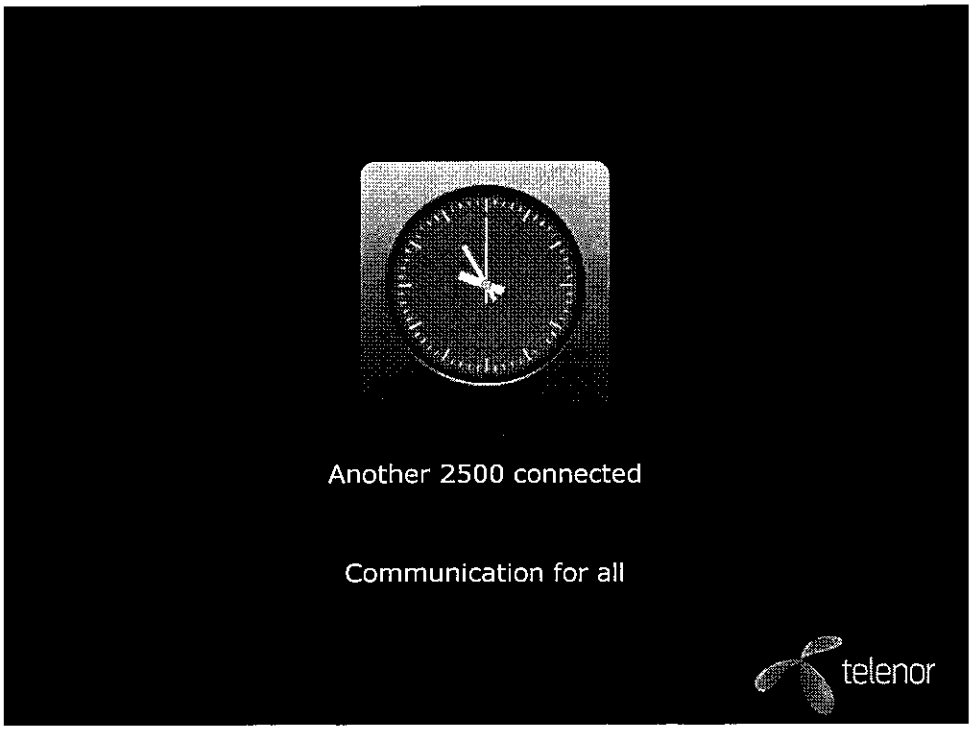
Economic contribution of mobile communication

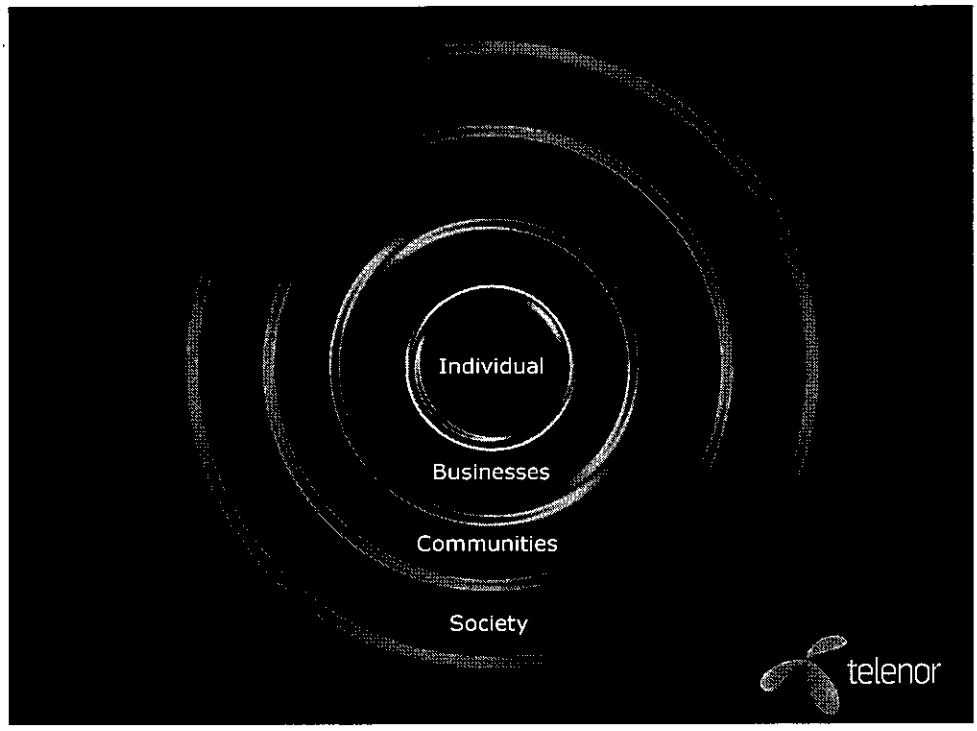
WTO Symposium on Telecommunications

Geneva 21 February 2008

Mrs. Harriet E. Berg
Vice President




Another 2500 connected
Communication for all
telenor


Individual
Businesses
Communities
Society
telenor

Social benefits of mobile communications - Health services

Bangladesh:
1 physician per 4,000 inhabitants

Pakistan:
3 physicians per 4,000 inhabitants

Ukraine:
12 physicians per 4,000 inhabitants

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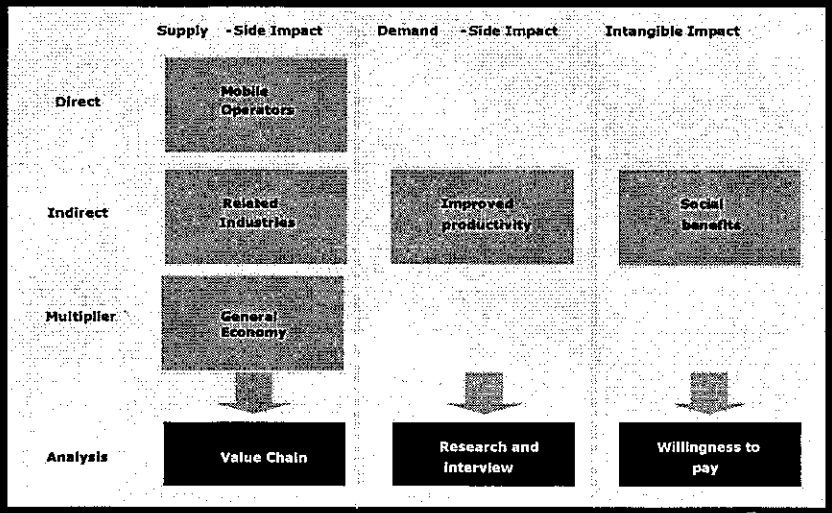
Methodology – Static analysis



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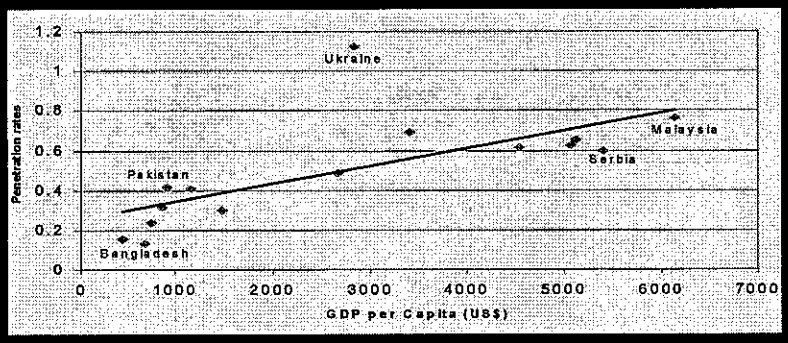
Methodology – Dynamic analysis

- Deloitte undertook a regression analysis using a cross-section of developing countries.
- They estimate that a 10% increase in penetration could increase the GDP growth rate of a country by 1.2%.



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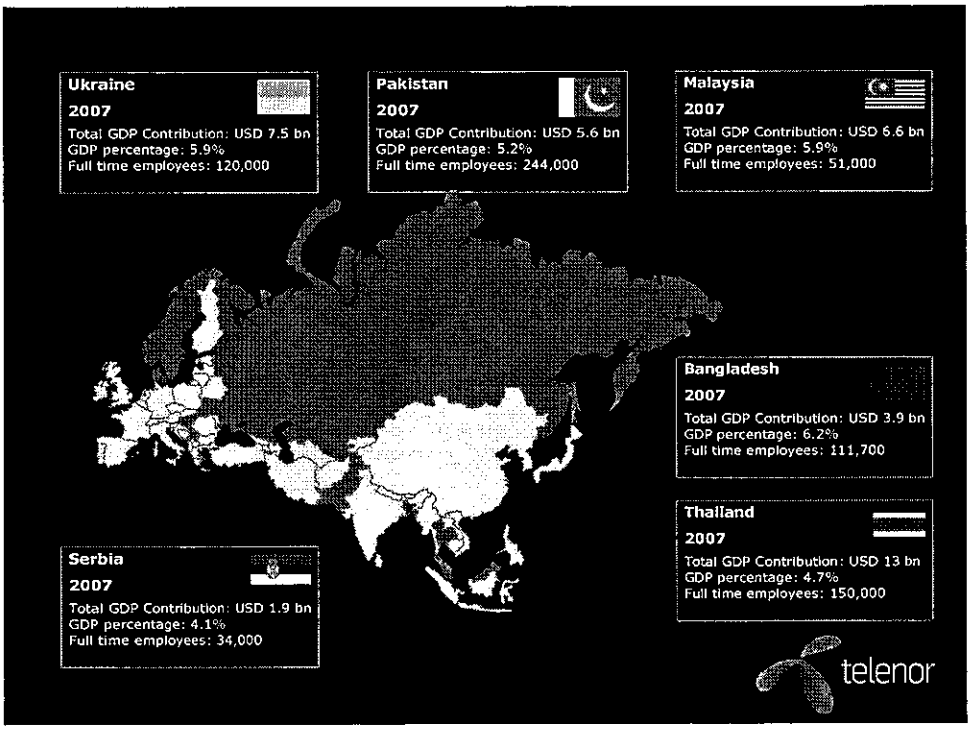

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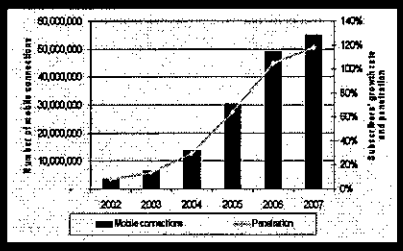
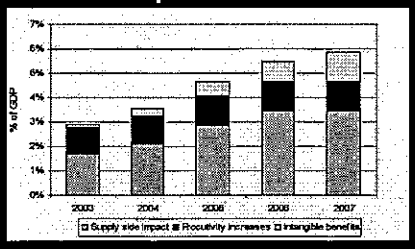
Ukraine

Penetration



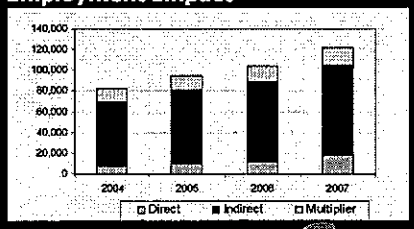
Economic Impact



Results

- Exponential growth in the market has occurred with growth standing at 70% per year on average.
- The economic impact of the mobile sector in 2007 was UAH 37bn, 5.9% of GDP.
- The mobile industry employs almost 120,000 Ukrainian full- time employees.

Employment Impact



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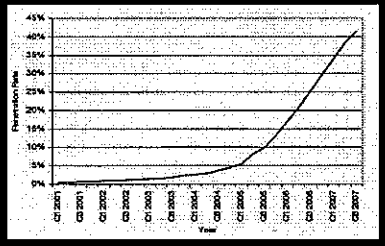
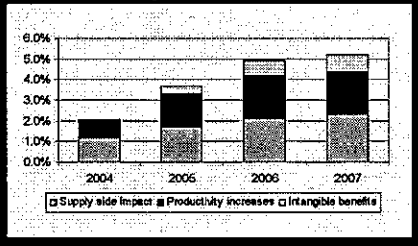
Pakistan

Penetration



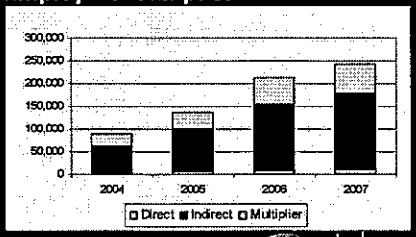
Economic Impact



Results

- Penetration has risen dramatically since 2006.
- The mobile communications sector is estimated to have contributed 5.2% to GDP & employed over 244,000 full-time employees in 2007.

Employment Impact



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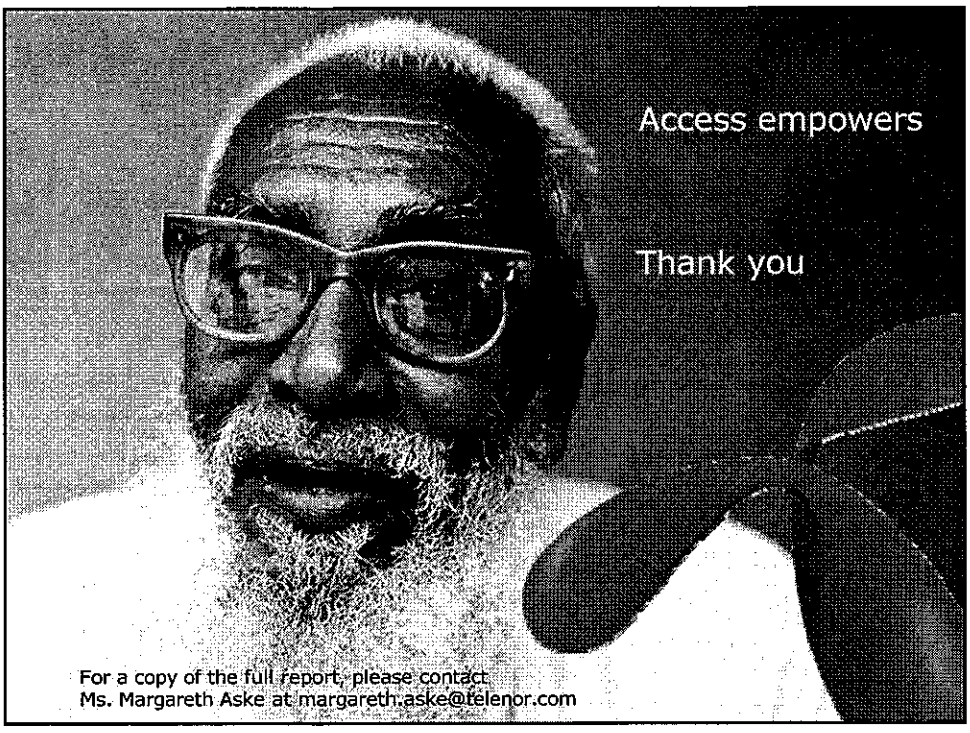
New opportunities emerging
Mobile broadband
Internet
New services
cell bazaar
বাজারতো পকেটেই
cellbazaar.com
telenor


Access empowers
Thank you
For a copy of the full report, please contact
Ms. Margareth Aske at margareth.aske@telenor.com

Symposium on Telecommunications

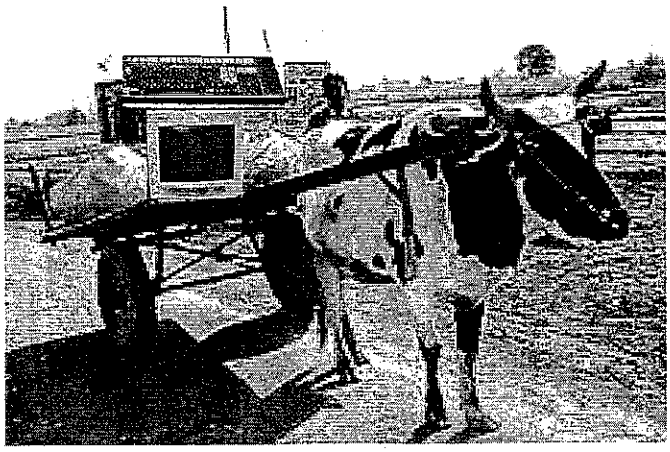
10th Anniversary of the Fourth Protocol to the GATS

Tobby Simon CEO - SYNERGIA

February 21, 2008

Mobile Computing – Phase I

Mobile Computing – Phase II



Mobile Computing – Phase III

Expansion of Telecommunications Networks & Services

WTO agreement on Basic Telecom Services came to effect on January 1, 1998

This led to an explosion in Telecom services the world over resulting in:

- Employment generation – Direct & Indirect
- E-Commerce – Internet based applications
- IT(Information Technology) Enabled Services
- Growth in Internet – fast dissemination of information
- Contributed to the world becoming a Global Village

Impact of Telecom on overall development

- Growth of Telecom faster than any other industry vertical
- Growth in GDP (Gross Domestic Product) of most developing countries directly linked to growth in Telecom
- Telecom network is the central nervous system of the world economy
- Speed of the telecom network controls the speed of economic activity

ICT as a route to development – The Rwandan example

Rwanda's 2020 Vision plan proposes, and schedules, full internet development, integration, and related education to emerge as a middle-income state.

Rwanda has very low reserves of natural resources, high population density, and hence has to depend on a knowledge-based economy.

Networking between schools in rural areas can eliminate a half-day's travel.

Rwanda has already invested heavily in fibre optics, to be laid up and down the country's hills and roads. Yet the most difficult stage of internet connectivity is 'last mile' connection.

In Rwanda, 'last mile' connection is even more difficult because of topography and infrastructure outside of major cities. Wireless signals are a solution, but WiFi, the most common form of signal, can only spread 10 meters from its base.

WiMax, a relatively new technology and already used in parts of Rwanda, has the potential to bring mass access to high-speed internet in rural areas, with the potential to send signals over a 50 Kilometre radius.

Social Benefits – Global Scenario

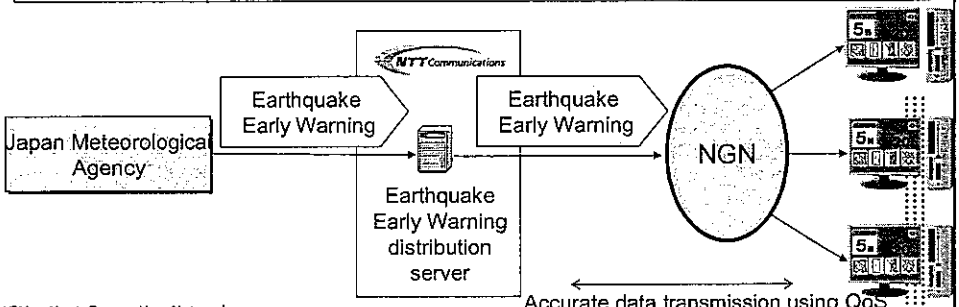
Distance Education

Content from institutions of excellence can be delivered to students at geographically dispersed locations through the medium of internet. This dramatically increases the reach of the elite educational institutions to benefit the community at large

Trial for Earthquake Early Warning Distribution Service

Service content

This service transmits Earthquake Early Warning , issued by the Meteorological Agency, to customers' devices via the NGN, forecasts the intensity and arrival time of major shocks, and provides warnings and notices.



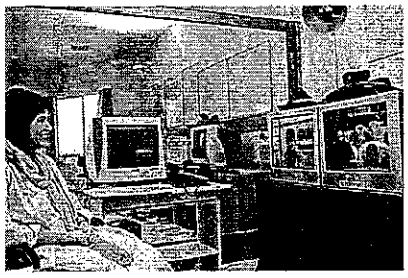
Accurate data transmission using QoS and SIP session control capabilities

NGN – Next Generation Networks
QoS, SIP – Terminology in Networking/ Signaling protocols

Social Benefits in India

- Direct employment for 2.8 Million and In-direct employment for 7.5 Million
- Opportunities in IT Enabled services – Starting from voice based call centers to BPOs to KPOs (Knowledge Process Outsourcing)
- Massive growth in Software Development services – developments in telecom facilitate digital data transmission
- E-Governance – Use of software applications in government – Better reach and increased transparency

Tele-Medicine



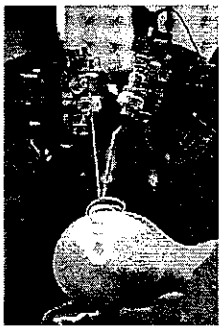
What is Tele-Medicine:

The facility to provide interactive healthcare using Telecommunications as the medium and modern medical technology as the tool. It could be either in real-time or asynchronous

Tele-Medicine- Current Applications

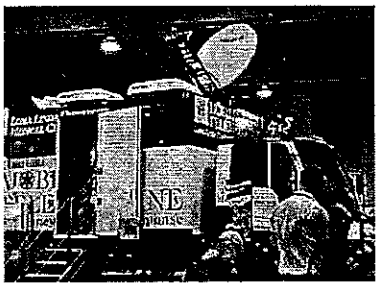
- Radiology
- Pathology
- Cardiology
- Real-time consultation during invasive procedures
- Medical Education

Advanced Tele-Medicine



Experts can view invasive procedures, medical reports etc. in real-time remotely, give advise to the local medical professional. Day is not far off when a surgeon sitting in the United States performs a surgery on a patient in India or the vice versa, accessing the equipment through remote control facilitated through the internet.

Advantages of Tele-Medicine



- Expansion of Patient outreach
- Cost savings by avoiding Travel
- Confidentiality
- Immediate and Urgent medical care
- Increased exposure and awareness for the local medical professional from the interactions with the specialist doctor

Tele-radiology – Outsourcing

Readings/Images are uploaded on to the web and stored securely. The outsourcing partner downloads the files and assigns to a qualified radiologist for study and opinion. The report of the radiologist is then uploaded for the use by the patient's doctor.

Applications in:

- Digital X-Rays
- Musculoskeletal, Doppler, Abdominal and Echocardiography Ultrasounds
- CT screenings of the whole body
- MRIs of Musculoskeletal, Spine, Brain
- Thoracic Imaging
- Cardiology and Coronary CTA

Future Trends in Telecom

- Convergence of:
  - Voice & Data (VoIP)
  - Personal Computer & Cell Phone
  - Television & Internet (IPTV)

- Unified Communications:
  A cohesive communications strategy, where all your applications and devices are integrated. For example, your email client (Outlook), Office EPABX, Mobile devices (BlackBerries, Cell Phones), CRM tools on PDAs – all share a common datastore of client information

- WiMax:
  Long Range Wireless Broadband Technology

Future Trends - Applications

- Applications with high Video content
- IP (Internet Protocol) TV – Television content transmitted through internet on telecom network – 'Content pull' instead of the current 'content push' (Subscribers accessing programs of their choice and at a convenient time)
- Distance Learning – Facilitates delivery of high quality education programs to multiple geographic locations
- Applications in Healthcare – Remote Medicine
- Payment authentication through Mobile applications
- Mobile Applications for enterprises

Future Challenges

- Inclusive growth – Improving the affordability for Urban and Rural poor in developing countries
- E-Waste disposal and management
- Introduction of more energy efficient hardware
- Control of Cybercrime – Concerns for Global security, Financial frauds and Personal privacy

Thank you all

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Next Generation Networks: The positive environmental effects of expanding telecommunications services though high-speed broadband networks[i]

by
Dr Tony Warren[ii]

Background prepared for remarks to the
World Trade Organisation's Symposium of Telecommunications to Commemorate the 10th Anniversary of the Fourth Protocol of the GATS
Geneva, Switzerland
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A. Introduction

I would like to begin today by thanking the WTO for this opportunity.

I did my PhD back in the 1990s examining what was then this new and innovative initiative called the GATS,[iii] with a particular focus on telecommunications. I thought then that the 4th Protocol was an important development in the liberalisation agenda because it locked in the gains already made in many core developed economies and sought to grapple with the complex issues of within country regulation.

With the benefit of 10 years of hindsight, I still think this instrument is a crucial first step in driving us towards open competitive markets in telecommunications – a goal that has increased significantly in importance over the past decade. There have been real gains as a result of this agreement and these need to be acknowledged upfront. This is also the agreement that must and I hope will form the bedrock for future liberalisation.

Today it is my task to:

- briefly highlight Telstra's concerns with the lack of progress in telecommunications liberalisation in some markets and how the Agreement has not to date facilitated access;
- detail some recent work we have done on how the telecommunications industry can facilitate the critical global need of reducing carbon emissions; and
- consider how energy and resource conservation might prove to be one of the issues that helps kick start the next wave of telecommunications liberalisation.

B. Lack of telecommunications liberalisation progress

Over many years Telstra has actively pursued investment opportunities within the Asia Pacific region. In some of these markets regulatory barriers to entry remain significant if not overwhelming. Licenses to operate are, in some cases, simply not available or constrained to niche parts of the market. In other cases, while licenses are technically an option, unreasonable delays in issuing the licence means that, in effect, a licence really is not available.

For example, in one of the Asia Pacific countries, Telstra applied for a licence in early 2005. We are still waiting for it to come out of a bureaucratic black hole. In the meantime, we find that the foreign ownership restrictions have been tightened and we may have to restart the whole application process again.

Have the WTO commitments and the 4th Protocol helped? Well to be frank, they haven't helped a great deal in our part of the world.

We find problem countries fall into two broad camps:

- The first are those that make big promises to the WTO but fail to deliver through a very narrow reading of those commitments ex post. What on the face of it looks like a clear commitment to allow a particular type of access, seldom transpires to be the case in reality, and
- The second are those whose very modest commitments have long been overtaken by reality on the ground. As a result, you are seeking access in areas in which no commitments have been made.

At best the commitments give us some rhetorical lever, some moral high ground or standing from which to argue our points. The possibility of taking formal action, however, is really not on the radar.

Realistically, how can we improve on this situation? What is going to be the impetus for Governments to embrace telecommunications liberalisation in the Doha round?

Clearly international comparisons are not enough. Australia opened up to 100 per cent foreign-owned competition back in 1997 and despite widespread predictions, the sky has not fallen in. Rather, we have a vigorous and competitive market.

In 1992, Australia allowed in one extra fixed carrier and two additional mobile operators. In 1997, all restrictions on entry were removed. By 2006, we had:

1992 2 carriers
3 mobile operators 3

- 157 carriers
- 4 mobile operators
- 23 mobile resellers, and
- 467 Internet Service Providers.

I would not suggest that we in Australia have done everything right – far from it. There is a compelling case that our regulatory arrangements need to be reviewed, especially so as to promote investment. But despite those shortcomings, few would deny that competition is alive and well and that liberalisation has provided tangible benefits to consumers in terms of better services, lower prices and more choices.

This positive experience with liberalisation is not limited to Australia. Still many countries cling to barriers and constraints that restrict competition, especially from off-shore. It is my understanding – and I do not claim to follow these matters as closely as I once did – that this affinity with restrictions is very much in evidence in the latest round of negotiations on services.

C. Climate change opportunities using telecommunications

But I hope all is not lost for the liberalisation agenda. Clearly, the Doha round of negotiations are still on foot and some tentative progress is being made.[iv] Many factors will determine whether or not various economies actually lock in their existing telecommunications regimes and whether or not they commit to more open arrangements. What I would like to do today is discuss a new factor that may help provide the impetus needed to liberalise global telecommunications: the issue of climate change.

Following the Bali Conference in December 2007, it seems likely that all countries – developing and developed – will need to dramatically reduce their carbon footprint.

It is little wonder that a recent survey found that sixty per cent of global executives regard climate change as a strategically important issue.[v]

Telstra believes that telecommunications can and must play a central role in reducing carbon emissions across a range of industries, using telecommunications infrastructure. In October last year, we released a detailed 100-page report titled *Towards a High-Bandwidth, Low-Carbon Future: Telecommunications-based Opportunities to Reduce Greenhouse Gas Emissions*.[vi]

The report was researched and written independently by a Sydney-based professional services consulting company called Climate Risk that analyses risk, opportunity and adaptation issues around climate change.

The report establishes quite clearly that telecommunications networks can play a significant role in helping to equip Australia to dramatically reduce its carbon emissions, as well as prosper in a future carbon-constrained world.

One important way to do this is quite simply through reducing energy consumption per unit of GDP.

Meaningful carbon abatement requires large-scale energy conservation – not just offsets and other accounting approaches that may or may not lead to less energy consumption or the more efficient use of resources.

The 2007 Survey of Switzer Fellow Scientists[vii] showed that of all greenhouse gas initiatives that can be used, increasing energy efficiency is by far the most effective.[viii]

Reductions in energy consumption also make good business sense. Research from the Corporate Executive Research Board[ix] has found that the highest payback from sustainability investments for organisations is from energy savings.[x]

Telstra's Climate Risk report details a range of solid, practical ideas that show how telecommunications can be utilised to dramatically reduce energy consumption, save business significant amounts of money and help Australia (and of course all other countries) meet globally-negotiated carbon emission reduction targets.

Specifically, the Climate Risk report identifies a handful of initiatives that can:

- **reduce Australia's total greenhouse gas emissions by nearly 5 per cent** – an amount that equals the annual emissions of nearly two-thirds of Australia's passenger cars, or the equivalent of turning off every light bulb in Australia for one year; and

- by doing so, we can **generate financial savings for Australian businesses and households of up to A$6.6 billion per year** (or almost $4 billion Euro).

The initiatives include:

- the rollout of **broadband-enabled network sensors** that can detect when home appliances, such as TVs are on stand-by or mobile phones have finished charging. Sensors can then automatically turn off power to the appliances reducing carbon emissions by an estimated 1.8 million tonnes each year;

- the rollout of **presence sensors** to turn off devices that are "on" but not being used. As a person moves out of a room, wireless-based presence sensors can turn off lights, air-conditioners and computers reducing carbon emissions by an estimated 3 million tonnes each year;

- the active facilitation of **teleworking** through broadband enablement. Assuming 10 per cent of Australians who have telework-suitable jobs, actually did telework from broadband-enabled homes or in regional telework business centres, Australia could reduce carbon emissions by an estimated 3.1 million tonnes each year;

- **freight vehicles** are empty 28 per cent of the distances they travel. Wireless broadband can be used to monitor vehicles in real-time so the data can be used to better assign cargo, reducing carbon emissions by an estimated 2.9 million tonnes each year;

- **personalised public transport** is fast and flexible, and involves a combination of mini-buses, 3rd generation mobiles and smart logistic applications allowing you to order carbon-efficient public transport to your door reducing commuter traffic and carbon emissions by an estimated 3.9 million tonnes each year; and

- about half of Australia's domestic air travel is for business, with many people travelling to attend short meetings. Face-to-face meetings are essential to business as the nuances of communication rely on body language and facial expressions as much as the spoken word. Until recently, there was no alternative to another business trip to achieve the face-to-face result. But now, "in-person" **high-definition video conferencing** can provide the same result as sitting in a room together. Using new video conferencing services in this way could reduce Australia's carbon emissions by up to 2.4 million tonnes a year.

Each of these initiatives is technically feasible and ready to be acted on now by the telecommunications industry. But each initiative relies fundamentally on widespread access to Next Generation Networks and leading edge applications. Traditional fixed public switched networks or 2nd generation mobile networks simply do not have the available bandwidth or capabilities to realise the significant opportunities presented in this report.

For example, the latest teleconferencing technology by Cisco – the widely-acclaimed Telepresence product – requires 40 Mbps. If it is going to benefit the entire economy then it has to be available to SMEs – and that means that the 40 Mbps must be broadly available.

D. Next wave of telecommunications liberalisation

There is a very active debate around the world at this moment on what is the best policy framework for underpinning the massive investments needed to roll out Next Generation Networks:

- the North Americans seem to favour regulatory forbearance – namely you don't regulate new networks like they are legacy networks particularly where there are competing cable networks in operation;
- in contrast, some in Europe seem to think more intrusive regulation in the form of 'operational separation' is the way forward. The 'logic' seems to be that if you hamstring the incumbent it may give others the space to invest.

The evidence on the ground in terms of investment supports the North American approach where we find significantly more investment in NGN than is found in Europe, but this is not the forum for that debate.

What is common ground and is of relevance to the WTO process is the absolute importance of liberalisation. Without open, uninhibited access to global technology, expertise, and capital it is very hard to see how any country can put in place the next generation infrastructure that can underpin substantive reductions in carbon emissions.

This is particularly evident in the mobile communications space. The last 15 years has been a period of spectacular global growth in our industry. Much of that growth, especially in developing countries, has been driven by the very rapid expansion of mobile networks. There can be no doubt

that that expansion would not have occurred without massive foreign investment, which brought not only financing but also technological and marketing skills. The transformation this has brought to many developing economies is obvious and includes not only direct economic benefits but a wide range of improvements in the quality of life.

With the move to 3rd generation mobile networks, the need for liberalised markets is even greater. For example, Telstra has just rolled out a world leading, nation-wide third generation mobile network which is on track to provide wireless data speeds of up to 21 Mbps in 2008 and up to 40 Mbps in early 2009. This was possible only because of our access to global talent and capital pools and our partnership with global vendors such as Ericsson.

And to some extent building *mobile* next generation networks is the easy part.

Mobile networks are by no means cheap, but they require far less investment per service in operation than is needed for the fixed network. As a result, the financial commitments that are needed to bring ubiquitous mobile communications are relatively small, and can be made acceptable to investors even in a world where the "rules of the game" in terms of trade and investment policy are still poorly developed.

However, if businesses and households worldwide – and not merely in the richest, already most liberalised, countries – are to gain the fullest benefit from telecommunications, including the environmental benefits, we must now take the more difficult step of bringing the world's *fixed* networks into the 21st century. That requires a truly massive

transformation, involving the deployment and operation of many billions of kilometres of cable and many hundreds of millions of nodes across the planet.

That transformation will simply not occur without a global move to remove remaining barriers to foreign investment and trade in telecommunications services. If nothing else, absent an international regime that gives global investors credible assurances about how their investments will be treated, the incentive to sink many billions of dollars into fixed networks will not be there.

To conclude, I suspect most of the people in this room would agree that further telecommunications liberalisation is essential for global economic growth and social development. We at Telstra believe that telecommunications can also make a significant contribution to the critical global issue of climate change BUT that it will only be with further liberalisation (and appropriate regulatory settings) that the next generation networks necessary to achieve real carbon emission reductions can realistically be developed.

I would like to finish by once again thanking the WTO for this opportunity. I hope I have stimulated some thinking on the intersection between telecommunications liberalisation and climate change.

ENDS

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[i] Thanks are extended to Ms Elizabeth Bardwell, Dr Phil Burgess, Prof Henry Ergas and Mr Danny Kotlowitz for their extensive contributions to this paper.

[ii] Tony Warren – Executive Director, Regulatory Affairs, for Telstra – is based in Canberra where he leads a team of professionals with primary responsibility for managing Telstra's regulatory issues and public policy positioning. Prior to moving to Telstra in 2001, Dr Warren was a Director of the Network Economics Consulting Group (NECG) which he joined in 1997 and helped build it into Australia's premier regulatory economics consulting firm. Before joining NECG, Dr Warren was a post-doctoral fellow at the Australian National University, leading a team of researchers developing methodologies for quantifying barriers to trade and investment in services. This project was an extension of Dr Warren's PhD dissertation on *The Political Economy of Services Trade and Investment*, and allowed for the first systematic modelling of the economic effects of services liberalisation, including telecommunications.

[iii] The World Trade Organization's General Agreement on Trade in Services (GATS) came into force in January 1995. GATS the first and only set of multilateral rules covering international trade in services and sets the framework within which firms and individuals can operate. The GATS has two parts: the *framework agreement* containing the general rules and disciplines; and the *national 'schedules'* which list individual countries' specific commitments on *access to their domestic markets by foreign suppliers*. My comments deal primarily with 'access' related issues.

[iv] Council for Trade in Services, 'Elements Required for the Completion of the Services Negotiations', 12 February 2008.

[v] How companies think about climate change: McKinsey Global Survey, www.mckinseyquarterly.com, 7 February 2008

[vi] See http://www.telstra.com.au/abouttelstra/csr/climate_change.cfm

[vii] 2007 Survey of Switzer Fellow Scientists, *What the Scientists Know: How business can help solve global climate change.*

[viii] Energy Efficiency (84%), improving manufacturing and distribution (62%), engaging stakeholders in policy discussions (31%), hiring/empowering environmental officer (28%), shifting investments (23%) all follow on the list of the effectiveness of greenhouse gas reduction initiatives.

[ix] Corporate Executive Board Research, *Survey of Corporate Sustainability Executives*, 2007.

[x] Energy savings (41%), waste savings (23%), product innovation (18%), corporate branding (6%), raw materials savings (6%) and water savings (6%).

Telecom Sector Liberalization & Deregulation in Pakistan: Economic and Social Benefits

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Socio-Economic Benefits of Telecom/ICT Access – An Overview

- Extensive literature on economic and social benefits of access to basic telecommunications and ICT's
- Economic Benefits
  - FDI, GDP, Government Revenues, Productivity gains, Employment generation, Consumer surplus
- Social Benefits
  - Income generation
    - Employment
    - Increase in indirect income generation capacity
    - Saving on expenditure or transaction costs
  - Efficiency in social service provision
  - Reduced gender disparity
  - Impact on poverty reduction

Liberalization & Deregulation of Telecommunication Sector of Pakistan

- Pakistan is a signatory to the Fourth Protocol to the GATS
- Fixed line and Mobile Cellular Policies approved in July 2003, Jan 2004 respectively
- Licenses issued as a result of the implementation of the policies:
  - Two new mobile cellular licenses issued
  - Existing Mobile licenses renewed
  - 14 LDI and about 83 LL Licenses Issued
  - 05 Wireless Local Loop (LL) operators have started service

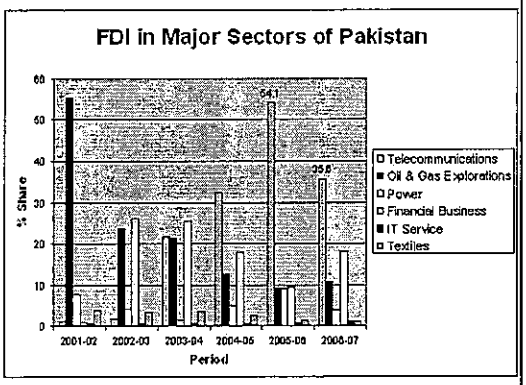
Impact on Proliferation of Services

- Telecom services sector is Pakistan's fastest growing sector
- Combined teledensity figure has already reached 53.41% compared to only 4% in 2003
- Increase in number of subscribers:
  - Fixed line from 4.04 million in 2003 to 4.86 in 2007
  - Cellular Mobile from 2.4 million in 2003 to 78.8 million today
- Current coverage of telecommunication services is around 70% of the population
  - intended to be increased to at least 85% within next three years
- Mobile sector exhibited growth of over 170% in 2006 & 80% in 2007 with fierce competition

Source: PTA, 2008

Economic Benefits

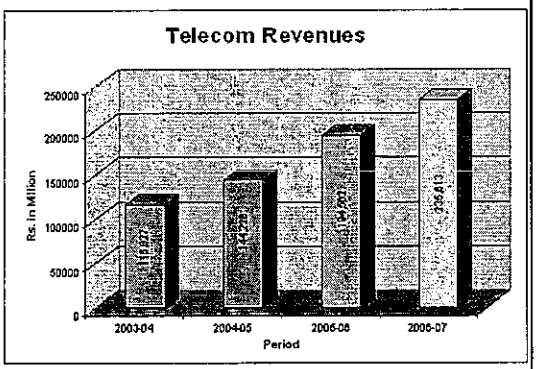
- **Contribution to GDP**
  - Direct contribution of Telecom Sector to GDP increased from almost negligible to more than 2% (2007)
    - 5% if indirect contribution is also added
- **Influx of FDI**
  - From negligible Foreign Direct Investment (FDI) a few years back, the telecom sector has attracted foreign investment on license and infrastructure of over US$ 8 billion and another US$ 4 billion is expected on roll-out by 2010
  - As a percentage of total FDI, Telecom Sector contributed more than 54% in 2005-06 and more than 35% in 2006-07



Source: PTA, 2007

Economic Benefits

- **Sector Revenues**
  - Revenues of Telecom Industry increased from Rs.115 billion to Rs.235 billion in last three years.
    - Expected to increase @20-25% p.a.
- **Contribution to the Exchequer**
  - Contribution of Telecom sector to GST/ CED Rs. 36,282 million per annum (2006-07)
  - Total GoP receipts from telecom sector through tax, deposits & other sources is more than Rs. 100 billion (2006-07)



Source: PTA, 2007

Social Benefits - Impact on Poverty Reduction

- Poverty
  - an outcome of interaction between and reinforcement of economic, social, and political processes which can lead to exacerbation or alleviation of deprivation experienced by poor men and women (World Bank, 2002)
- Four Main Dimensions
  - Opportunity
  - Capability
  - Security
  - Empowerment

Opportunity Defined

- 'access, or lack thereof, to labor markets and employment opportunities, and to productive resources; constraints on mobility; and ... time burdens ...'. World Bank (2002 p.1)

Opportunity Mediated through Telecom/ICTs in Pakistan

- Consumers have benefited through reduction in prices for both fixed and mobile services
  - current prices have come down to 20-30% of prices in 2003
- Mobile ownership at the "Bottom of the Pyramid" in Pakistan is as high as 23%, which is greater than Sri Lanka and India (Silva *et al*, 2007)
- Universal Service Fund Company efforts to have multiplier effect

Opportunity Mediated ... Contd.

- Employment
  - Direct & Indirect Jobs (2007): 1,366,698
  - (including downstream jobs, vendor industry and sub-contractors)
  - Estimated 58,009 direct & indirect jobs to be created in 2007-08
- TEACHE survey conducted in four provinces, AJK & NA's found that use of mobile phones on average induced 35% increase in sales of surveyed businessmen (PTA, 2007)
- Study by Silva & Zainuddin (2007) shows that more than 60% of sample respondents engaged in agriculture in Pakistan, India and the Philippines felt that access to telecom improved both the efficiency of their daily activities and their ability to earn or save more
- Contactability has eased mobility constraints for women

Capability Defined

- 'access, or lack thereof, to public services such as education and health' (World Bank, 2002 *p.1*).

Capability Mediated through Telecom/ICTs in Pakistan

- TEACHE survey of mobile users sites 52% respondents reporting improvement in access to doctors and health staff (PTA, 2007)
- Tele-health services being run by various international and non-governmental organizations
- Scholarship/Capacity Building Programmes of National ICT R&D Fund Company to have a multiplier effect

Empowerment Defined

- 'voice and decision-making power at the household, community and national levels' (World Bank, 2002 *p.1*).

Empowerment Mediated through Telecom/ICTs in Pakistan

- Citizen empowerment
  - ability to fulfill information and communication needs
  - ability to exercise choice of operator
- Silva *et al* (2007) reveal that mobiles have reduced the dependence of women on men in running general home errands
- TEACHE Survey concludes that women's say in family affairs has improved

Security Defined

- 'vulnerability to economic or environmental risks and to civil and domestic violence' (World Bank, 2002 *p.1*).

Security Mediated through Telecom/ICTs in Pakistan

- Improved sense of security and the ability to contact emergency services
  - disaster communication
  - ability of home-based women to contact their men in times of emergency
- Improved family cohesion and social kinship

Conclusions

- Telecom sector liberalization and deregulation has and is continuing to improve access to telecom services to nearly all segments of the society
- Economic and social benefits have been significant and continue to multiply
- Government is keen to undertake measures necessary to ensure sustained growth in socio-economic benefits

What Next?

- Advancement in mobile applications and ICT services such as broadband to open new avenues of socio-economic development through ICT4D
  - E-/M-learning
  - E-/M-health
  - E-/M-banking
- Fulfillment of WSIS commitments
- Entrepreneurial Opportunities
  - Empowerment of home-based workers
- Bridging of the gender opportunity/capability gap

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SYMPOSIUM ON TELECOMMUNICATIONS TO COMMEMORATE THE 10th ANNIVERSARY OF THE FOURTH PROTOCOL TO THE GATS

PANEL E

CORPORATE PERSPECTIVE ON DEVELOPMENTS IN TELECOMMUNICATIONS MARKETS

Geneva, 21st February

The GATS, the BTA and the Reference Paper have contributed to global growth of the Telecommunications sector based on two factors

- Liberalisation → **Adoption** of commitments for market access allowing foreign investors to compete on equal footing with national operators
- Legal Certainty → **Implementation** of commitments creating the necessary degree of predictability for foreign investors

Two main trends will continue to reshape the new ICT sector on a global context in the next ten years...

Convergence	**Convergence** of networks, devices and services is driving innovation and new forms of inter-platform IP-based competition
Globalisation	Operators need to satisfy services demands from **global** customers, extending their footprint internationally

... posing a real challenge to telecoms trade negotiations

Need for further liberalisation	Enlarging the number of countries that eliminate trade barriers that impede market access
Services Coverage	A new range of convergent services has to be covered through trade negotiations