



7. ICT Infrastructure and Access

- III: RF 2 - spectrum, interconnection, USO, costing/pricing & converged issues -

UNESCAP/ITU Regional Training Workshop on Enabling Policies and Regulatory Frameworks for Information and Communication Technology (ICT) Development in the Asia-Pacific Region

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Agenda = Major Regulatory Frameworks

1030H - 12:00H, Regulatory Frameworks I:

- Independence of Regulator
- Competition Safeguard
- Licensing and its Criteria

1300H - 1430H, Regulatory Frameworks II:

- Scarce Resources (e.g., Spectrum, Numbering, etc)
- Interconnection
- Universal Service and Its Funds
- Costing & Pricing
- Others through converged ICT

Scarce Resources: Spectrum

Why radio spectrum/frequency ?

1. Growing needs for radio frequency

2. Vital resource for economic growth

- Growing broadcasting + telecom + IT = ICT Industry
- Internet via WiFi & mobile phones;
- Initiating to create new businesses in ICT sector; and
- Supporting and developing other overall industry.

Check-list for radio spectrum/frequency

- ✓ Management/policy of radio spectrum
- ✓ Allotment/Assignment of spectrum at affordable prices for sufficient enough bands
- ✓ Licensing & Pricing of spectrum: entry & usage fees
- ✓ Efficiency and optimization of spectrum with techniques:
- ✓ Harmonization of spectrum
- ✓ Meeting future growth requirements

✓ Management of scarce spectrum

- 4.1. Member States shall endeavour to limit the number of frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services.
- 4.2. Member States undertake that in assigning frequencies to stations which are capable of causing harmful interference to the services rendered by the stations of another country ...
- 4.3. Any new assignment or any change of frequency or other basic characteristic of an existing assignment shall be made in such a way as to avoid causing harmful interference to services rendered by stations using frequencies assigned in accordance with the Table of Frequency Allocations ...

{Source: ITU, Radio Regulations, Article 4}

✓ Allocation, Allotment & Assignment

- **Allocation** (of a frequency band): Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radiocommunication services or the radio astronomy service under specified condition: I.e., frequency distribution to services;
- **Allotment** (of a radio frequency or its channel): Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one of more administrations for the [same] purpose above: I.e., frequency distribution to areas/countries;
- **Assignment** (same above): Authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions: I.e., frequency distribution to stations.

{Source: ITU, Radio Regulations, Article 1}

✓ Management at different levels

- **Allocation** (of a frequency band): i.e., frequency distribution to services – at/by ITU
- **Allotment** (of a radio frequency or its channel): I.e., frequency distribution to areas/countries – at/by ITU
- **Assignment** (same above): I.e., frequency distribution to stations – at/by each country

✓ Method of assignment

For Entry:

- ✓ First-come first-served base
- ✓ Beauty content
- ✓ Auction etc.

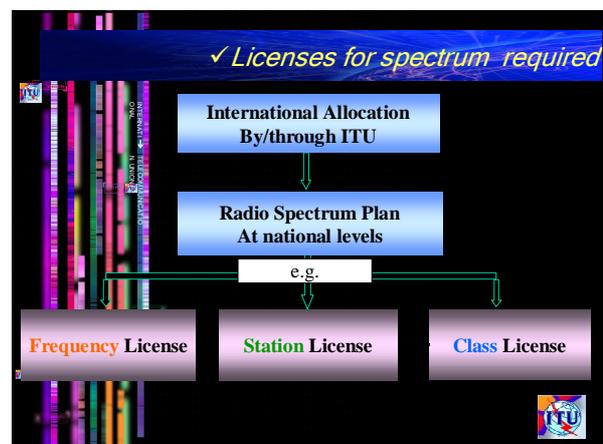
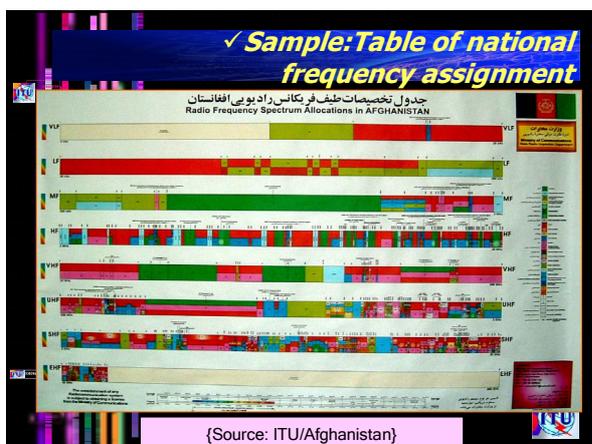
Require fees

For Usage:

Annual fees per KHz

e.g.,

- US\$0.5/KHz for cellular & WLL in Bangladesh
- US\$0.1/KHz for cellular; US\$0.1/5KHz for WLL; US\$0.008/KHz for WIFI in Philippine



✓ Frequency license related issues

- Licensees : Telecom carriers, service providers and/or network operators
- Allocation method : Beauty contest, auction etc.
- Pricing : normally for administrative costs (but, auction as done for 3G in Europe)
- Right : Exclusive right of spectrum utilization
- Duration of license : less than 20

e.g. Korea

✓ Station license related issues

- Licensees : most of radio stations including fixed, mobile, etc
- Principle : Normally first-come first-served
- Technical criteria : Center frequency, channel bandwidth, transmitter power, location etc.
- Expiration date : less than 5 years

e.g. Korea

✓ Class license related issues

- Generally issued for ISM bands and devices (e.g., W-LAN, bluetooth, alarm transmitter, remote control etc.) where power of emission is low;
- Require for 'Type Registration' to satisfy technical criteria;
- Licensed devices share the spectrum;
- Not protected from interference

e.g. Korea

✓ e.g. GSM frequency assignment status

Country	No. GSM op	Total frequency for GSM	Average GSM bands per op
Belgium	3	2 x 81.0 MHz	2 x 27.0 MHz
Denmark	4	2 x 109.6 MHz	2 x 27.4 MHz
France	3	2 x 74.4 MHz	2 x 24.8 MHz
Germany	4	2 x 80.0 MHz	2 x 20.0 MHz
Hungary	3	2 x 68.6 MHz	2 x 22.9 MHz
Ireland	3	2 x 62.4 MHz	2 x 20.8 MHz
Italy	4	2 x 71.6 MHz	2 x 17.9 MHz
Netherlands	5	2 x 105.8 MHz	2 x 21.2 MHz
Spain	3	2 x 64.2 MHz	2 x 21.4 MHz
Sweden	3	2 x 75.0 MHz	2 x 25.0 MHz
Switzerland	3	2 x 79.6 MHz	2 x 26.5 MHz
United Kingdom	4	2 x 105 MHz	2 x 26.3 MHz
China	2	2 x 45.0 MHz	2 x 22.5 MHz
Malaysia	5	2 x 90.0 MHz	2 x 18.0 MHz
Thailand	3	2 x 57.1 MHz	2 x 19.0 MHz

{Source: TRAI, India} Average: 2x22.5 MHz

✓ Frequency bands for 3G/IMT-2000

3G/IMT services (e.g., mobile Internet) can be provided using any of the ITU approved radio interfaces identified by the ITU

Radio Regulations: e.g.,

- 1885-2025 MHz
- 2110-2200 MHz
- 806-960 MHz
- 1710-1885 MHz
- 2500-2690 MHz

e.g., Afghanistan

✓ Spectrum licensing/pricing – e.g., 3G

Country	Company	Price \$	License Date	License Conditions/Service Status
France	Orange SFR	551 million	May 20, 2001	Must offer services to 80% of the population by 2005, 20-year license plus 1% of revenues
Germany	E-Plus Mobilfunk O2 Germany Quam (Group 3G) T-Mobile Deutschland Vodafone D2	7.62 billion 7.67 billion 7.63 billion 7.70 billion 7.63 billion	July 31, 2000	Services were to start from January 2002 and cover 25% of the population by the end 2003, and 50% by the end of 2005, 20-year license
Italy	H3G IPSE 2000 TIM Vodafone Omnitel Wind	2.01 billion 2.02 billion 2.00 billion 2.03 billion 2.01 billion	October 18, 2000	Coverage must extend to regional capitals within 30 months and provincial cities within 60 months; 20-year license
Japan	Vodafone K.K. KDDI NTT DoCoMo	Free	June 12, 2000	Amidst competing technological standards, Japanese mobile operators already have millions of subscribers and near total national coverage
South Korea	KT Freetel LG Telecom SK Telecom	994 million 898 million 994 million	Dec. 15, 2000 Aug. 25, 2001 Dec. 15, 2000	South Korea's major mobile operators already have close to 20.7 million subscribers to high speed services
United Kingdom	Hutchison 3G UK mm02 Orange T-Mobile UK Vodafone	6.90 billion 6.35 billion 6.44 billion 6.30 billion 9.40 billion	April 26, 2000	Services must cover 80% of the population by 2006; 20-year license. Hutchison 3G predicts it will have one million subscribers by the end of April

Malaysia: RM 50 million + additional fees

{Sources: 3G Newstrum, UMTS-Forum, ITU, OFCOM}

✓ Efficiency and optimization of spectrum

- With such techniques as:
 - synthesized frequency hopping
 - Tighter frequency re-use plan/cell splitting etc.
- With further research & development for new techniques and technologies



✓ Harmonization of spectrum

For such benefits as: e.g.,

- economies of scale in manufacturing of equipment;
- Competitive market for equipment procurement; and
- Increased spectrum efficiency etc.



✓ Meeting future growth requirements (1)

- Countries are working on ways to meet the future needs and growths of scarce spectrum at national and ITU levels: e.g.,
 - Australia: liberalized spectrum management regime with introduction of a combination of "secondary trading" and administrative incentive pricing: I.e., licence holders are able to sell, lease, repackage and change the use of standard trading units assigned to

* Services where governments require universal service provision are generally deemed unsuitable for the "second trading (which means that licences can be subsequently traded by buyers and sellers, without necessarily passing through the regulator's hands)".

{Source: ITU News, No.3 April 2004, pp.23-9}



✓ Meeting future growth requirements (2)

- Countries are requesting for spectrum to be identified at the international level for new applications and technologies to provide larger markets, economies of scale and international roaming;
- International technical standardization is being developed by the industry, rather than regulatory bodies, especially in "licence-exempt bands"*.
- A need for coordination at the international level first before countries take decisions was recognized. **Otherwise, it could have adverse cross-border effects.**

* "License-Exempt spectrum" means that access to spectrum does not require prior authorization; Any user satisfying certain conditions (e.g., relating to the power of equipment) may have access to the band in question.

{Source: ITU News, No.3 April 2004, pp.23-9}



✓ Radio Frequency for the Future: 4G ?

ITU-R Definition

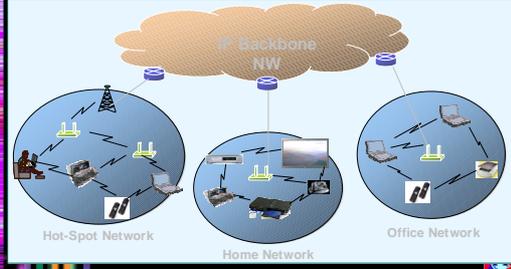
- A service that provides multimedia information at the speed of 100Mbps in high mobility through new mobile access around the year of 2010;
- Internet (IPv6) access environment at any time and any place;
- Seamless interconnection with other networks, with high security & QoS

4G further requires for planning/developing Spectrum, R&D, standard, & service



✓ Radio Frequency for the Future: High Speed Wireless LAN

500Mbps~1Gbps level high speed multimedia service at home, office & hotspot




✓ Radio Frequency for the Future: Terrestrial DMB

- Multimedia broadcasting service under mobile condition
- Broadcasting service with high quality (HD video & CD audio)

The diagram illustrates a terrestrial DMB system. On the left, 'Content Provider' feeds into 'Radio Studio' and 'TV Studio'. These connect to a 'Service NW (IP/Data NW)'. This network then goes to 'Service Multiplex & Transmit', which is connected to a tower. The tower broadcasts to 'Mobile Terminals', which include 'Portable Terminal', 'Fixed Terminal', and 'Mobile Terminal'. A 'Mobile Communication NW' is also shown at the bottom, connected to the tower and the mobile terminals.

✓ Radio Frequency for the Future: Satellite DMB

- Nationwide multimedia broadcast service under mobile condition
- SD level video and CD level audio

The diagram shows a satellite DMB system. An 'Earth Station' is connected to a 'Satellite'. The satellite broadcasts to 'Mobile Terminals'. A 'Gap Filler' tower is also shown, connected to the satellite and the mobile terminals. The system is linked to an 'Internet' cloud and a 'Terrestrial mobile Communication NW' at the bottom.

✓ Radio Frequency for the Future: Public Protection & Disaster Rescue

Satellite-Mobile communications integrated network for public safety & rescue

The diagram depicts a network for public safety and rescue. It includes 'Monitoring Sat', 'Communication Satellite', 'Aircraft', 'Personal Equipment', 'Vehicle Equipment', 'Robot, Manless Equipment', and 'Server'. Arrows indicate the flow of communication between these elements, showing how they are integrated into a single network.

✓ Towards Realization of Ubiquitous Network Society

The flowchart starts with 'Telephone line (ADSL, CATV)' (Usable No. of line: 35 mil, actual use: 12.26 mil) and 'Optical fiber' (Usable No. of line: 16.8 mil, actual use: 12.26 mil). These lead to 'Wireless Broadband'. A box lists: 'guidelines for frequency reforming', 'expansion of frequency for "Broadband"', and 'flexible use of radio spectrum environment'. This leads to 'Broadband Convergence of Wire & Wireless, Advent of Ubiquitous Society', which results in 'Creation of New Industry (Infrastructure & Users industry)' and 'Creation of Applications'. The final goal is 'the world's most advanced wireless Network', which leads to 'Rebirth of Economy', 'Hopeful, affluent society', and 'Visible existence of Japan'.

SUMMARY

All these new and converged wireless ICT technologies with new and various applications require for:

- high demands of radio frequencies – I.e., leading to scarce spectrum;
- appropriate and efficient spectrum management, policy & regulations including allotment/assignment, licensing and pricing; &

Interconnection

The word 'Interconnection' is displayed in a large, white, serif font against a dark blue background with a network-like pattern.

Check-list for Interconnection

- ✓ Importance of interconnection
- ✓ Scope & definition of interconnection
- ✓ Major accepted interconnection principles
- ✓ Key interconnection issues
- ✓ Other interconnection related issues

Importance of Interconnection

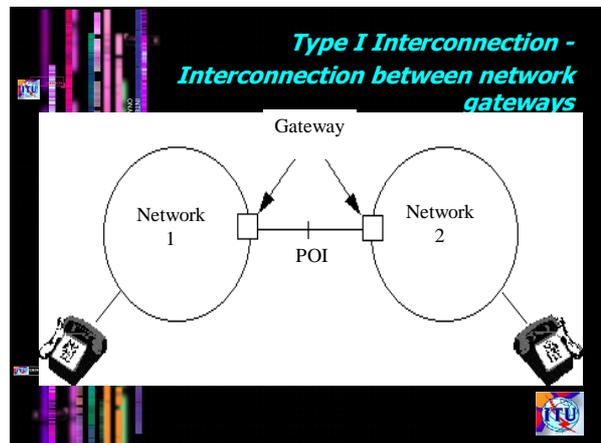
Interconnection is a key factor for effective 'competition' in de-regulated or liberalized telecom and now converged ICT sectors for 'connectivity' and 'inter-operability' among competitive networks & services, especially between dominant operators and new entrants including

- cellular mobile.

Scope of Interconnection

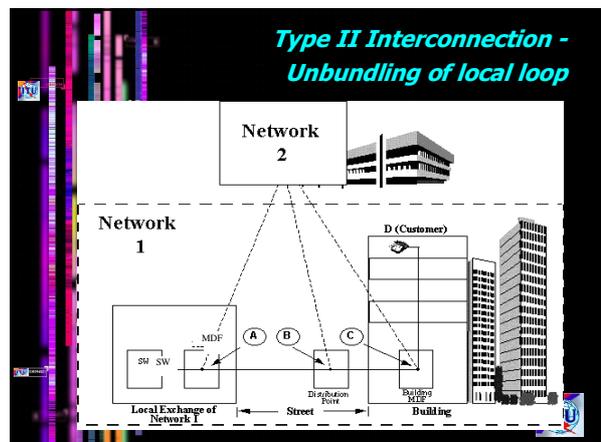
- Different regimes/countries have different definitions: e.g., Europe

"Interconnection means the physical and logical linking of public electronic communications networks used by the same or a different undertaking in order to allow the users of one undertaking to communicate with the users of the same or another undertaking, or to access services provided by another undertaking. Services may be provided by the parties involved or other parties who have access to the network"



Type I Interconnection: e.g., Hong Kong

- Gateways can be toll exchanges, tandem exchanges, local exchanges or dedicated interconnect gateways
- A point of interconnection (POI) is a notional point in the mid-point of the link interconnecting the gateways of two networks
- Interconnection should be made upon the request of any network operator



*Type II interconnection:
e.g., Hong Kong*

- Interconnection of Network 2 to Network 1 is possible at any of the points A, B or C
- Interconnection is only permissible upon the request of the customer at point D to become a direct customer of Network 2
- After interconnection, the customer at point D becomes a direct access customer of Network 2
- After interconnection, the operator of Network 1 continues to own, maintain

✓ *Major Interconnection Principles (1)*

- **Terms of interconnection should be non-discriminatory:**
 - Between dominant or non-dominant
- **Interconnection should be permitted at any technically feasible point:**
 - If no standard, requesting operator should pay additional costs
- **Interconnection charges:**
 - Should generally be *cost based*
 - But, where reciprocal interconnection costs are balanced, may consider 'bill and keep' and 'not cost based' = I.e. simple.

✓ *Major Interconnection Principles (2)*

- **Regulatory guidelines and procedures should be prescribed in advanced to facilitate negotiations**
- **Standard terms and procedures should be published for interconnection to dominant operators**
- **Interconnection procedures and arrangements should be transparent**
- **Interconnection arrangements should encourage sustainable competition**
- **Network elements should be unbundled and charged separately**
- **Charges relating to universal service should be identified separately and not bundled with interconnection charges**
- **Regulator should resolve interconnection disputes quickly and fairly**

✓ *Key interconnection issues (1)*

- **Framework and procedural issues**
 - Regulatory guidance
 - Interconnection with incumbents
 - Standard interconnection terms
 - Independent and timely dispute resolution
 - Non discriminatory access to interconnection facilities and services
 - Access to PSTN networks including planned changes
 - Treatment of Universal Service, Universal Access or Access Deficit Charges

✓ *Key interconnection issues (2)*

- **Commercial issues**
 - Level and structure of interconnection charges; basis for calculation (i.e. type of costs used to calculate charges, revenue sharing, bill and keep etc.)
 - Unbundling of interconnection charges for different network components and related services
 - Resale of network facilities and services
 - Payment for network modifications to facilitate interconnection
 - Confidential Treatment of competitive and customer information

✓ *Key interconnection issues (3)*

- **Technical and Operational Issues**
 - Open network standards and technical compatibility
 - Location of points of interconnection (PoI)
 - Access to signaling systems, advanced digital features, billing system, operations support systems (OSS), call related databases
 - Access to unbundled network components, including local loops
 - Equal ease of customer access to competitive networks
 - Access to numbers and implementation of number portability
 - Collocation and sharing of infrastructure (e.g. buildings, poles, ducts etc)
 - Quality of interconnection, including availability of sufficient interconnection capacity to avoid congestion and to ensure timely provisioning of interconnection services and facilities

✓ Additional interconnection issues (4)

- Interconnection is an important consumer issue;
- Reluctance of incumbent operators to provide access to competitors;
- Attempts by the incumbent to provide discriminatory or high-cost interconnect;
- Inclusion of universal service contributions, and perhaps also access deficit contributions, in interconnection charges
- Inexperience or under dominance of new entrants, inhibiting them from fighting their interconnect battle;
- Inadequately defined legal obligations to interconnect;
- Lack of regulatory safeguards where the incumbent fixed carriers are permitted to operate in mobile markets.
- Inadequately enforced regulatory interconnect regime; and
- Grey areas in regulatory regime with respect to related issues, such as carrier selection, number portability, or costing guidelines.
- Inadequate interconnection arrangements not only impose unnecessary costs and technical problems on operators – they also result in delays, inconvenience and additional costs for business, consumers, and ultimately, for national economy.

Source:
"Background Paper"
At ITU Forum on
Private Sector Issues
New Delhi, India
April 24-26, 2004



✓ Other interconnection related issues

➤ Number Portability:

Number portability is, in fact, an interconnect service, which is extremely important to the effectiveness of competition in local, mobile, and free phone services. Without number portability, customers can expect to change their telephone numbers each time they change carriers. In most countries, the issue of implementing number portability is overshadowed by strong economic considerations of moving to a portable number regime.

Source:
"Background Paper"
At ITU Forum on
Private Sector Issues
New Delhi, India
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SUMMARY

1. Operators encouraged to reach **commercial agreements** through negotiation based on guidelines published by regulator – I.e., 'soft' regulation – in multi-players' ICT sectors;
2. Roles of regulators are very critical to:
 - Ensure rights & obligations between dominant and new operators including ISP
 - Resolve disputes between operators, if any
 - Place a fair and reasonable costing methods
 - Ensure transparency for principles, guidelines on procedures, & publication



Universal Service and Its Funds



Check-list for Universal Service

- ✓ Definitions & evolution of Universal Service/Access
- ✓ Universal Service: Goals & Practices
- ✓ Universal Service: Key issues
- ✓ Ways of reaching Universal Service
- ✓ Ways of raising USO funds with examples
- ✓ ITU's Universal Access Guidelines



✓ Definitions of Universal Service / Access

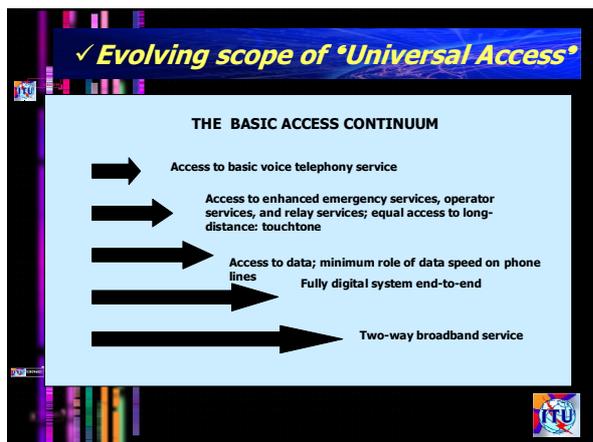
In principle:

Universal Service: providing individual household connections to public telecom/ICT network & service.

Universal Access: ensuring that all people have reasonable means to access a publicly available telephone/Internet in their community through shared use of lines or terminals (e.g., public payphones, community telecentres, teleboutiques or community Internet access centres).

But, the scope/practice of Universal Service differs in each country: e.g., Access to from 'basic telephony' in one-day reaching on foots, 'village', To 'Internet' by individuals.





- ### ✓ Universal Service: Goals & Practices
- **Availability**
 - **Affordability**
 - **Accessibility**
 - Initially implemented by monopoly or incumbent operator as an obligation
 - Very few countries have achieved universal service/access goals solely through monopoly operators

- ### ✓ Issues of Universal Service
- Universal Service policy
 - License conditions
 - Cross subsidies
 - Universal Service Obligation (ISO) funds
 - Interconnection levies and access deficit charges

- ### ✓ Principle objectives of US policies
- Allow full participation in the Information Society
 - Promote economic development
 - Encourage equal access by all segments of the population
 - Promote national political, economic and cultural cohesion
 - Reduce the digital gaps between rural and urban areas; & haves and have-nots.

- ### ✓ Ways of reaching Universal Service
- 'Mobile' is the prime example: More mobile than fixed line subscribers in many countries – I.e., no more rich men's device
 - 'Prepaid' makes it affordable
 - 'Public' access, through various centres initiated
 - 'SMS' even cheaper than voice with a limited e-mail substitute
 - 'New and/or accessible technologies' such as VSAT, WiFi etc. suitable for geographical and financial circumstances of countries

- ### ✓ Ways of raising USO funds: Examples (1)
- Equitable contribution by all market participants
 - Fixed percentage of designated revenues
 - Incumbent operator as a social obligation
 - **Cross subsidy between services:**
 - India, most countries
 - **Access Deficit Charge:**
 - USA, Canada
 - **Roll out Obligations in License:**
 - Brazil, India
- In general: →
- Examples Of Countries →

✓ *Ways of raising USO funds: Examples* (2)

- Government Subsidy
 - Bidding Approach, Chile, Peru
- Incumbent's Liability
 - UK
- Other incentives
 - Sri Lanka (1 rural telephone = 10 normal telephone for the purpose of roll out), one time subsidy of Rs 50,000/= to 3000 phones
 - Special home zone tariffs
 - Use of cellular phone like Grameen Phone in Bangladesh

✓ *ITU's Universal Access Guidelines* (1)

1. Enabling regulatory environment: Role of governments/regulators

- Formulate a national policy identifying appropriate and realistic universal access/service objectives
- Include all citizens, regardless of gender, ethnicity, socio-economic level or geographic location
- Review its policies, regulations and practices periodically
- Create incentives for the private sector to extend universal access to communication services
- Establish a fair and transparent telecom regulatory framework
- Adopt technologically neutral licensing practices
- Adopt a framework of interconnection rates linked to costs
- Reduce regulatory burdens to lower the costs of services
- Promote competition in the provision of a full range of ICT services to increase access, affordability, availability and use of ICTs.

{Source: Doc.31, ITU GSR, Geneva 8-9/12/2003}

✓ *ITU's Universal Access Guidelines* (2)

2. Access to information & communication infrastructures

- Provide services in a competitive framework using new technologies that offer both innovative services and affordable pricing options to a wide range of end users
- Promote affordable ICT equipment including national manufacturing of IT equipment, reduced customs tariffs and duties, and end-user loans to foster affordability of ICT equipments
- A full range of public access options to be developed (e.g., telecentres)
- Local input into projects to increase their long-term financial sustainability
- Educate local people on the benefits of ICTs and their use to increase their long-term financial sustainability.

✓ *ITU's Universal Access Guidelines* (3)

3. Finance and management of universal access policy

- Universal service funds can be financed by a broad range of market players, managed by neutral bodies such as regulators, and be used to kick-start public access projects that meet the needs of the local community.
- Governments may consider a full range of other financing mechanisms including tax incentives for ICT providers and end users
- Competitive minimum subsidy auctions could be used, as an option, to reduce the amount of financing necessary for public access projects financed by a universal service fund
- Public access projects can be designed to achieve long-term financial self-sustainability, exp. Where consideration is given to innovative low-cost technologies.

SUMMARY

Universal Service/Access to ICT is today not only 'human right' but also a critical prerequisite of daily lives for individuals, efficient management for private sector, and good governances for public sectors. Regulators, thus, are encouraged to

- Monitor and review continuously evolving its definition and scope in each country over the times along with technological development or innovation; and
- Ensure appropriate USO funds, which are fair to all through policy & regulatory frameworks.

Costing & Pricing

Check-list for Costing & Pricing

- ✓ Importance of costing & pricing with 2 scenarios
- ✓ Reasons of costing & pricing
- ✓ Correlation of costs, prices, & markets
- ✓ Major costing & pricing mechanisms with examples
- ✓ Pricing information availability
- ✓ Major guidelines of pricing
- ✓ Major trends of pricing in ICT services
- ✓ ITU's R&D on costing & pricing

✓ Importance of costing/pricing

- Affordability for customers
- Efficiency in industries' production
- Efficient allocation of economic resources in all of costing/pricing chain
- The "Wealth" of governments/nations and companies

FOR

Win+Win+Win Game, when it is right

✓ Two scenarios of costing

S.1

- 1. A high level of levies including one of more of license entry fee, annual license fee, spectrum usage charges, USO funds, Access Deficit Charges, import duties on infrastructure equipment and handsets, excise duties, sales & service tax, VAT etc.
- 2. Most of these, with the exception of sales and service tax, become cost elements of the service even before the end – users start using the service.
- 3. if the costs are high, price (e.g. end-user tariffs) would be unavoidably high and would result in
 - seriously retarding growth of telecom/ICT usage and penetration/access; and
 - lowering revenues to Government from the service tax.

- 1. All the pre-usage costs could be kept low as practically acceptable.
- 2. The costs cover only Government's cost of administering and regulating the sector including the important costs (e.g., USO)
- 3. This would result in
 - lowering end-user tariffs with affordability;
 - growing telecom/ICT infrastructure and services – i.e., economic wealth;
 - increasing tax revenues from industries to the Government; and
 - eventually, improving quality of lives.

S.2

✓ Reasons for costing/pricing

- Consumer protection
- Prevention from anti-competitive pricing from monopoly or incumbent as well as subsidy, if any
- Support Universal Service and its funds
- Set up cost-based benchmarks for reasonable pricing

✓ Correlations among cost, price, demand and markets

- PRICE = End-user tariffs
 - PRICE > COST = PROFIT
 - COST > PRICE = LOSS, DEFICIT
- PRICE v Demand: e.g.,
 - When price decreases, Demand increases
 - when price increases, Demand decreases
- Market = Interaction of SUPPLY and DEMAND

✓ Major costing/pricing mechanisms

1. Reasonable Return on Investment
 - total operations; specific services
2. Price Caps: e.g., RPI-X in the UK
 - total operations; specific services or prices
3. Benchmarking
4. Long Run Incremental Cost (LRIC): US and Europe

3. Benchmarking ?

- Before using the Benchmarking, compare consumer price levels between similar economies in e.g. the Asia-Pacific Region
- Benchmarking:
 - can complement cost studies as it is quicker, easier and more dynamic (responding to market trends);
 - is especially useful in a competitive but regulated market (e.g. to assist in gaining regulatory approval for tariff restructuring)



4. Long Run Incremental Cost (LRIC) ?

- Advocacy costing delays market development
- LRIC is neither scientific nor precise
- LRIC is a conceptual tool for calculating reasonable cost benchmarks
- Simplicity and transparency are essential
- Success requires that study parameters be negotiated and agreed in advance



✓ Pricing information availability:

Pricing information is important and useful for operators as well as customers.

Example to get pricing information in the UK:

- Mobile telephone data are available from OFTEL (now, OFCOM), the U.K. regulator;
- Quarterly series, which include calling minutes, new connections, number of subscribers and revenues for each of the competing operators (Vodafone, Cellnet, One2One and Orange) are issued with a time lag of about 8 months;
- Shortly after quarterly results are tabulated each operator usually issues a press release detailing its gains in net subscriptions by contract and prepaid



✓ Guidelines for costing & pricing

- Undertake a price comparison based on regional & national customer profiles (consumption) for developing economies (residence and business);
- Develop national skills in designing, applying and interpreting price comparison models;
- Develop awareness of international and domestic price trends and 'comparative price measurement techniques' for operators,



✓ Major trends of pricing

- **Fixed/mobile rivalry: Fixed operator**
 - eliminates 'domestic' mileage charging bands;
 - goes to large 'local calling areas' (e.g., only 3 calling 'bands/zones' such as local zone - very large, adjacent zone, and non-adjacent zones).
- **Fixed/mobile/wireless access rivalry (voice & data=ICT):**

Fixed operator offers: e.g.,

 - 'flat-rate' local calling charges;
 - fixed monthly rates with no per call or per minute pricing (e.g., Canada, US, NZ);
 - 'counter cellular pricing'.
- **Mobile/wireless pricing:**
 - 'consumer specific-packages' based on usage patterns, e.g., pre-paid/calling cards;

Source: OECD Report: Mobile Pricing Structures and Trends



✓ ITU's R&D on costing & pricing

Aims at increasing access to (ICT), by costing & pricing for the development of ICT

- Use of a cost model (service costs, tariff regulation, competitiveness and creation of a telecommunication company);
- Elasticity of demand/price in a competitive environment;
- Pricing of telecom services provided through IP-based networks in the converged ICT environment;
- Global assessment of developing countries' needs and identification of relevant support projects.

Source: ITU, Investing in Telecom and ICTs in Developing Markets: Shifting The Paradigm



SUMMARY

Costing and Pricing are important and requires for delicate balance among various stake-holders: e.g.,

- Customers
- Network operators/service providers including ISP
- Governments/regulators

at liberalized and competitive ICT markets.

Price should be rebalanced with regular monitoring to ensure lowering of tariffs.

When the costs and prices reasonable and affordable, it will be the very 'win'+ 'win'+ 'win' game for all stakeholders with



OVERALL SUMMARY: REGULATORY FRAMEWORKS

- **Regulated telecom sector is getting de-regulated with more 'soft' regulations;**
- **Liberal IT sector is getting regulated: e.g.,**
 - Under the similar telecom's regulatory frameworks due to convergence of ICT;
 - Under the revised and new computer or cyber laws.
- **Each country has its own rules and practices under the same regulatory frameworks (refer to tables in IV: Case Studies).**
- **Each regulatory framework itself is evolving, when new technologies emerge: Thus, 'technology neutral'**



Others esp. through converged ICT



Quality of Service: Scope

Six benchmarks for the performance parameters among SATRC:e.g.

1. on call completion rate,
2. fault incidence,
3. fault clearance rate,
4. time for providing the connection after the payment,
5. waiting list clearance and
6. disposal of billing complaints,

for ICT services such as Mobile and VoIP

Source: APT, SATRC Action Plan 2004



Quality of Service = Consumer Protection: Ways of Implementation

QoS:

1. Pledging, measuring, reporting & monitoring of performance through performance indicators.
2. Publishing statistics on the number of customer complaints
3. Metering & billing accuracy
4. Undertaking customer satisfaction survey

CP:

1. 'Code of Practice' for contract practices
2. Industry practice for customer services
3. 'Code of Practice' for protection of customer information
4. Enforcement of section 7M of the Telecom Ordinance.

e.g., OFTA, Hong Kong



Information Technology Agreement (ITA)

- During the Singapore Ministerial Conference of the WTO, a proposal for the expansion of world trade in information technology products was adopted vide the "Ministerial Declaration on Trade in Information Technology Products" dated 13th December 1996.
- The objective of the Agreement is to bring down tariffs on IT items in stages to zero level by a specified year
- The updated list of products proposed to be covered under ITA II includes a few consumer electronic items and certain security related products
- The agreement became effective once the number of countries joining the agreement represent 90% of the trade in information technology products. Other WTO Members could opt to join the agreement as a participant

{Source: http://commerce.nic.in/wtoit_2.htm}



Customs: Rules & Procedures

- **Customs & its procedures** in most countries are governed by the customs law(s) of the country or region like EU.
- The **import levies** to be paid (e.g., customs duty based on value, VAT, excise duties) are specified in the customs tariffs or excise laws at national/regional levels.
- Special arrangements in the form of **customs preferences** with the countries or regions concerned.
- Unilateral customs exemptions can be granted to the developing countries, based on the certificated **origin of the goods**.
- **Detailed customs procedure, as an example, for ASEAN countries** at <http://www.aseansec.org/economic/customs/custproc.htm>.
- **Simplified and transparent customs rules and procedures within reasonable time period will enable operational & business environment.**

Standards: Importance and Implications

The average annual economic growth in Germany between 1960 and 1990 was 3,3 %. By DIN

- Economic growth is highly influenced by standards, according to DIN;
- ITU-T & ITU-R standards are used for license requirements in

"Self- or Soft-regulation": e.g., Industry Forums

Industry is more sensitive to & directly influenced by policy & regulations. Thus, it is encouraged to have "Industry Forum" for their voices.

As well as suppliers

Which would guide industry conduct

Consumers and Industry players

Form Industry Forums

To produce Voluntary Industry Standards

For the benefit of Consumers

Access Consumer Content Technical

e.g., Malaysia

"Self- or Soft-regulations": e.g., Code of Practices

Various Socio-Economic Development Issues - e.g., disabled, consumers, Privacy gender etc. - Can be also dealt with Soft-regulations Such as "Code of Practices"

- Code of Practice on the Provision of Telecommunication Services for the Elderly and People with Disability: OFTA, Hong Kong <http://www.ofta.gov.hk/ad-comm/ucac/paper/uc99p5.html>
- Code of practice for protection of Consumer Information
- Code of Practice for Contract

New & emerging laws : "Hard-regulation" governing misuse of ICT & Cybercrime

Increasing Misuse of ICT & Cybercrimes e.g., -Virus - spam - fraud - porn etc., led

Many countries & regions To enact More "hard-regulation" In free & open IT sector

- Asia-Pacific: Penal Legislation on Computer Crimes
- Australia: Cybercrime Act 2001, Spam Bill 2003,
- Canada: Computer related offences found in the 1998 Criminal Code of Canada
- CIS&Baltic: Responsibility for Computer Crimes
- EU: E-Commerce Directive
- EU: E-Privacy Directive
- EU: Telecommunications Privacy Directive
- Singapore: Computer Misuse Act, Spam Act
- Malaysia: Computer Crime Act, 1997
- USA: Final Bill- Spam Act of 2003, Computer Crime Law (Texas); Spam Laws (Virginia)

Conclusion

ICT Policies and Regulations:

- Can play a critical role to promote the growth of industry and to improve quality of individuals' lives
- When they are implemented in a non-discriminatory, efficient, and transparent manner with clear guidelines; and
- When they are playing not as a burden for industry - esp. entrants - but as a carrot for their innovation and competition;

But, should be 'means' or 'safeguard' rather than 'goal' or 'burden' for healthy development of ICT infrastructure and applications to have affordable access as well as for bridging the widening digital gaps not only between countries but also within countries.

How to use the means successfully is subject to each country's

For more information

- For updated information about ICT policy & regulatory issues:
<http://www.itu.int/ITU-D/treg/Events/Seminars/2004/Bangkok/index.html>
- For more in-depth regulatory modules:
http://www.ofta.gov.hk/frameset/home_index_eng.html
- For more updated information about spectrum, interconnection, & cost-levies:
<http://www.itu.int/ITU-D/partners/Events/New-Delhi-2004/index.html>



The End

Thank you

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