

# Agenda

- ◉ Day 1 - Basics of Satellite Communications
- ◉ Day 2 - Policy and Regulatory Guidelines for Satellite Services **and Analog TV to DTT\***
- ◉ Day 3 - Network Planning (Satellite trends, Link budget)\*
- ◉ Day 4 - Vsat Installation and Maintenance
- ◉ Day 5 - Vsat Equipment and Bandwidth Procurement

**\* - Eldo Kurian from Intelsat**



# Day 2

## Policy

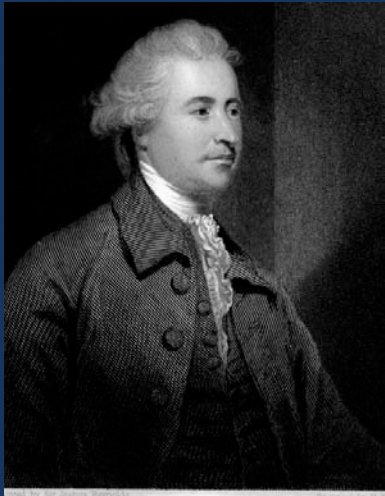
# Policy and regulatory Guidelines

- ◉ Radio Regulations Organizations
- ◉ Satellite policy principles
- ◉ Legal framework of satellite organizations
- ◉ Key regulatory and licensing trends
- ◉ Analog TV to DTT

# Policy and regulatory Guidelines

- ◉ Radio Regulations Organizations
- ◉ Satellite policy principles
- ◉ Legal framework of satellite organizations
- ◉ Key regulatory and licensing trends
- ◉ Analog to digital TV

# Regulation e.g balance



“All government, indeed every human benefit and enjoyment, every virtue, and every prudent act, is founded on compromise and barter we give and take; we remit some rights, that we may enjoy others.”

- Edmund Burke, English Statesman, 1775



# Radio Regulation Organizations

With the increasing number of countries interested in launching their own satellites it has become necessary to discipline sky occupation and it was constituted the ITU - International Telecommunication Union (May the 17th 1865) currently with over 193 member states and more than 700 organizations public and private target on:

- ITU-T ( ex-CCITT regulates telecommunications)
- ITU-R ( ex-CCIR regulates radiocommunications and allocates freq.)
- ITU-D (technical assistance to developing countries )

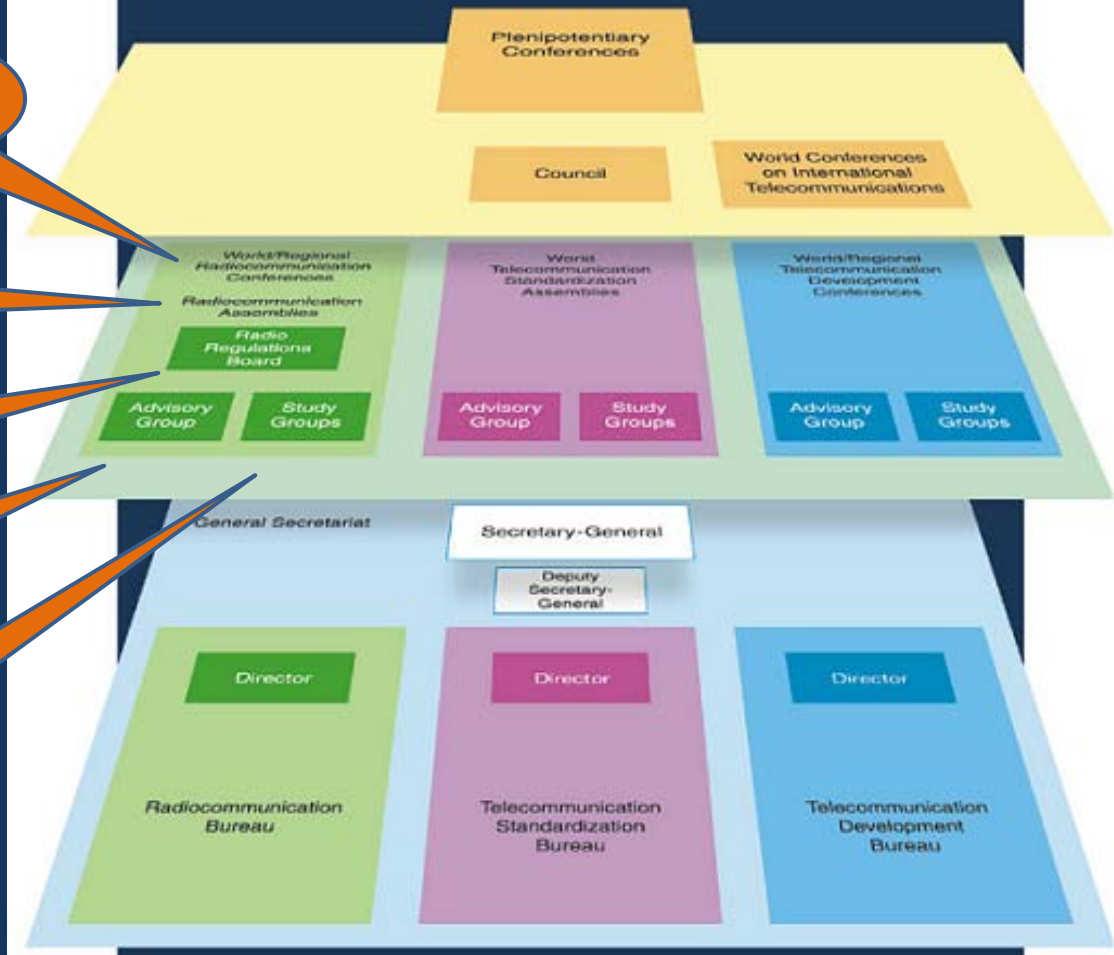


# Radio Regulation Organizations

- **Radiocommunications** The Radiocommunication sector of ITU-R coordinates a wide and growing range of services, as well as the international management of the orbits of satellites and radio frequencies spectrum.
- **Regulation** ITU-T standards (recommendations) are fundamental to the functioning of modern ICT networks. Without ITU standards, could not be make voice call or use Internet.
- **Development** The Telecommunications Development Sector, ITU-D has a program of offerings for those who are interested in starting or expanding their presence in emerging markets or pursue a mandate of corporate social responsibility.



# Structure



WRC

RA

RRB

AG

SG



# World Radiocommunication Conference

## ◎ Held every 3 ~ 5 years

- WRC 2012 ( Geneve 23 Jan - 17 Feb )
- WRC 2007 ( Geneve 22 Oct - 16 Nov )
- WRC 2003 ( Geneve 9 Jun - 4 Jul )
- .....

## ◎ Regulatory review and advice Radio

- Internacional treaty - use of radio spectrum and satellite tools
- Determine questions for study by RA, SGs

# Radiocommunications Assembly (RA)

- ◎ Normally meets with WRC 3 ~ 5 years
  - RAG 2012 (Almaty Kasakhstan 5 Set - 7 Set)
  - WRC 2012 ( Geneve 23 Jan -17 Feb )
  - WRC 2007 ( Geneve 22 Oct - 16 Nov )
  - WRC 2003 ( Geneve 9 Jun - 4 Jul )
  - .....
- ◎ Work priorities, urgency, time-frames
- ◎ Approve ITU-R recommendations , technical studies in support of WRCs

# Radio Regulations Board

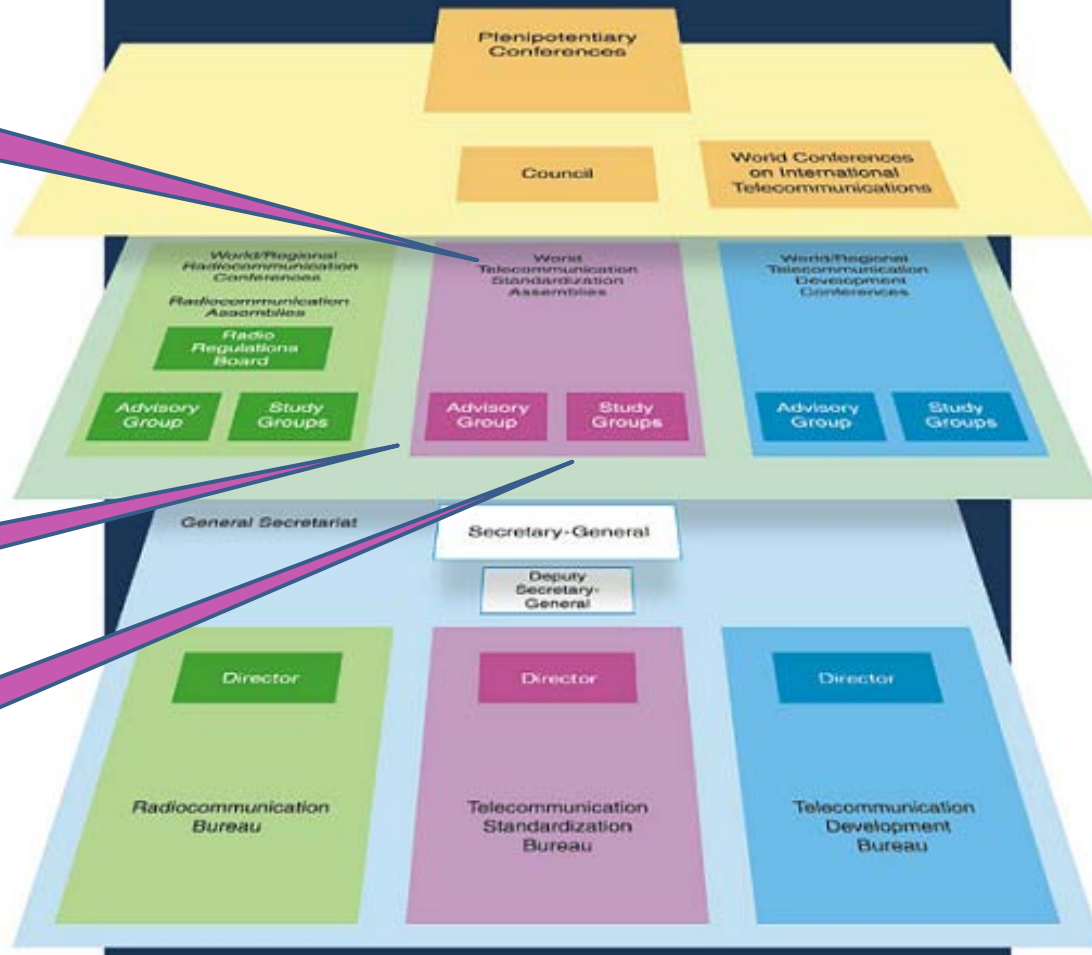
- ◎ Approves Rules of procedure for applying Radio Regulations and registering frequency assignments made by Member States
- ◎ Addresses matters referred by the Bureau which cannot be resolved through application of Radio Regulations
- ◎ Provides advice to Radiocommunications Conferences and the Radiocommunication Assemblies

# Study and Advisory Groups (SG - AG)



- SG 1 – Spectrum management
- SG 3 – Radiowave propagation
- SG 4 – Fixed satellite service
- SG 5 – Terrestrial services
- SG 6 – Broadcasting services
- SG 7 – Science services
- SG 8 - Mobile, radiodetermination, amateur and related satellite services ( **disbanded for SG4 and SG5**)
- SG 9 - Fixed service (**disbanded for SG5**)
- CCV - Coordination Committee for vocabulary
- CPM - Conference preparatory meeting
- SC - Special committee on regulatory / procedural matters
- RAG - Radio advisory Groups

# Structure



WTSA

AG(TSAG)

SG

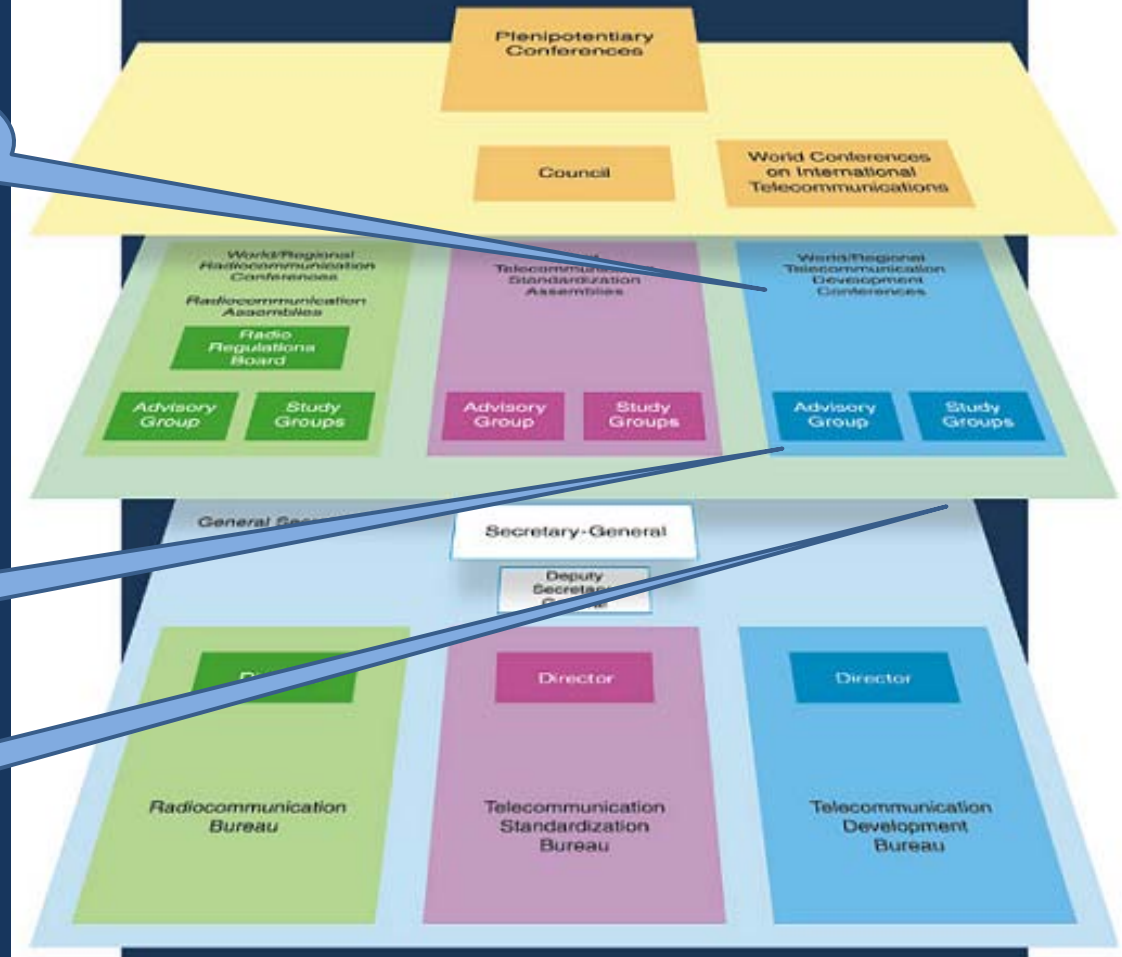


# Study and Advisory Groups (SG - AG)

- SG 2 - Operational aspects
- SG 3 - Economic and political issues
- SG 5 - Environmental and climate changes
- SG 9 - Broadband cable and TV
- SG 11 - Protocols and tests verification
- SG 12 - Performance QoS and QoE
- **SG 13 - New generation networks**
- SG 15 - Transport and access
- SG 16 - Multimedia
- SG 17 - Security
- SG 19 - Mobile networks
- TSAG - Telecommunications standardization advisory groups



# Structure



WTDC

AG(TDAG)

SG



# Study and Advisory Groups (SG)

- SG 1 - Enabling environment, cybersecurity, ICT applications and Internet - related issues
- SG 2 - Information and communication infrastructure and technology development, emergency telecommunications and climate-change adaptation

# Radiocommunication services



## Main issues

- Mobile broadband including IMT
- Regulatory
- Safety
- Environment
- Science
- Navigation and Mobile Satellite



# WRC 12 Agenda

- Mobile broadband and IMT issues
- Regulatory issues
- Security issues
- Environment issues
- Science and satellite issues
- Navigation and mobile satellite issues  
(Aeronautical, Maritime and Radioamateur)

# Mobile broadband and IMT

## *International Mobile Telecommunications*

- ◉ New frequency allocation (694-790MHz) to facilitate development of land mobile broadband applications (effective after WRC 15).
- ◉ Developing wireless high-speed data applications above 70 GHz.
- ◉ Bandwidth usage 6520 - 6440 MHz and 6560 - 6640 MHz by the high altitude platforms (HAPS) for fixed service.
- ◉ Digital dividend bandwidth usage (DD) result from analogue to Digital TV transition, in new applications (IMT - Advanced 3D TV, ...)

# Mobile broadband – new allocations



## Mobile in the UHF Band



Spectrum bands allocated to mobile	Region 1	Region 2	Region 3
<b>450-470 MHz</b>	Will not be implemented in most European (CEPT) countries	No intended use in US and Canada	
<b>698-862 MHz</b>	Region1 (WRC-12)	N+S America	nine countries (inc Japan, China, and India)
<b>790-862 MHz</b>	Europe, Africa and Middle East		all other Asia Pacific

# Regulatory issues

- ◎ Impact on spectrum management of software defined radio (SDR), cognitive radio system (CRS), as consequence of its congestion in urban areas.
- ◎ Increase and proliferation of short-range devices (SRD), on all bands.
- ◎ Explosive growth of new convergence technology based applications radio, justifying revision of the regulatory framework and spectrum management.
- ◎ Broadcast Satellite service in the band 22GHz
- ◎ Using free space optical links



# Aeronautical security issues

- ◎ Prioritization of satellite communications in routes, for security and regularization of flights.
- ◎ Limitation of 37-38 GHz band in the aeronautical mobile as protection to other primary services
- ◎ Increased security and radio links new applications / air traffic management concepts.
- ◎ Free adjustment operation of drones (UAS) in areas not reserved, with 5 GHz band allocations.
- ◎ Aeronautical frequencies recording in the master international frequencies register



# Maritime security issues

- ⦿ Introduction of digital technologies to respond adequately to new security maritime services.
- ⦿ Growing need to improve the identification, monitoring and surveillance of vessels and cargoes, as well as the security of ports, by means of automatic identification systems (AIS).
- ⦿ Allocation of 162 MHz and 156.8 bands for search and rescue.
- ⦿ Universal range 500 MHz allocation for broadcast and information security.

# Radiolocation security issues

- ⊙ New applications with surveillance cameras, monitoring and actuation of two focused on the VHF band.
- ⊙ Autoradars to improve road safety.
- ⊙ Radioastronomy in service protection 4990 -5000 MHz band unwanted emissions of satellite radionavigation service (Earth-space) in the band 5010 – 5030 MHz
- ⊙ Oceanographic radars 3-50 MHz data collecting disaster effects mitigation, climate change, security perception astral travel.

# Environment issues

- ⊙ Importance the use of ICTs to combat climate change and weather and natural disaster relief.
- ⊙ Introduction of the principle of time difference of arrival (ATD), able to detect strokes of lightning thousands miles away from the center of discharges, allocating the 8.3 and 11.3 KHz band.
- ⊙ Extension of the current band of weather satellites (7, 9GHz), to 7.75-7.85 GHz to accommodate new generation MeteoSat, with higher bandwidths and debts.

# Science and satellite issues 1

- ◉ New allocation 22.53 - 23.25 GHz for FS and MS protection in neighbouring countries, such as strengthening the 25.5 - 27 GHz (DL) for video/voice/data in transit or missions near the moon.
- ◉ Protection of passive services spectrum usage of climatology and meteorology and astronomy (275 to 3000 GHz bands).
- ◉ Need high resolution sensors 8 GHz for weather, climate and those people of catastrophes.
- ◉ Regulation of nano and picosatélites.

# Science and satellite issues 2

- ◉ MetAids systems for detection and location of atmospheric discharges and for operationalizing and safeguard lives in extreme conditions (VLF bands).
- ◉ Spectrum requirements for positioning and radio-determination satellite applications, enabling social benefits.
- ◉ Increased interest in space exploration (manned and robotic) around the moon to take environmental and landing points.
- ◉ Mobile satellite services in the 2 GHz band.

# Science and satellite issues 3

- ◎ Revisit fixed service and maritime mobile satellite service in the band 7-8 GHz
- ◎ Earth exploration Services through satellite - direction earth / space in the band 7 - 8 GHz, and possible expansion of the current allocation to the Earth exploration by satellite (active) 9300 - 9900 MHz up to 600 MHz in the band 8700-9300 MHz or 9000-10500 MHz.
- ◎ Satellite broadcast:
  - Due diligence
  - Limits to power flux density (PFD)
  - Flexibility safeguard

# Science and satellite issues 4

- ◎ Usage of band 410 - 420MHz for space research (space-space).
- ◎ Implement the electronic submission of information networks and satellite systems before its formal publication.
- ◎ Use of the bands 5150 - 5250 / 5250 - 5350 and 5470 - 5725 MHz, of mobile service for implementation of wireless access systems included at local radio area networks.

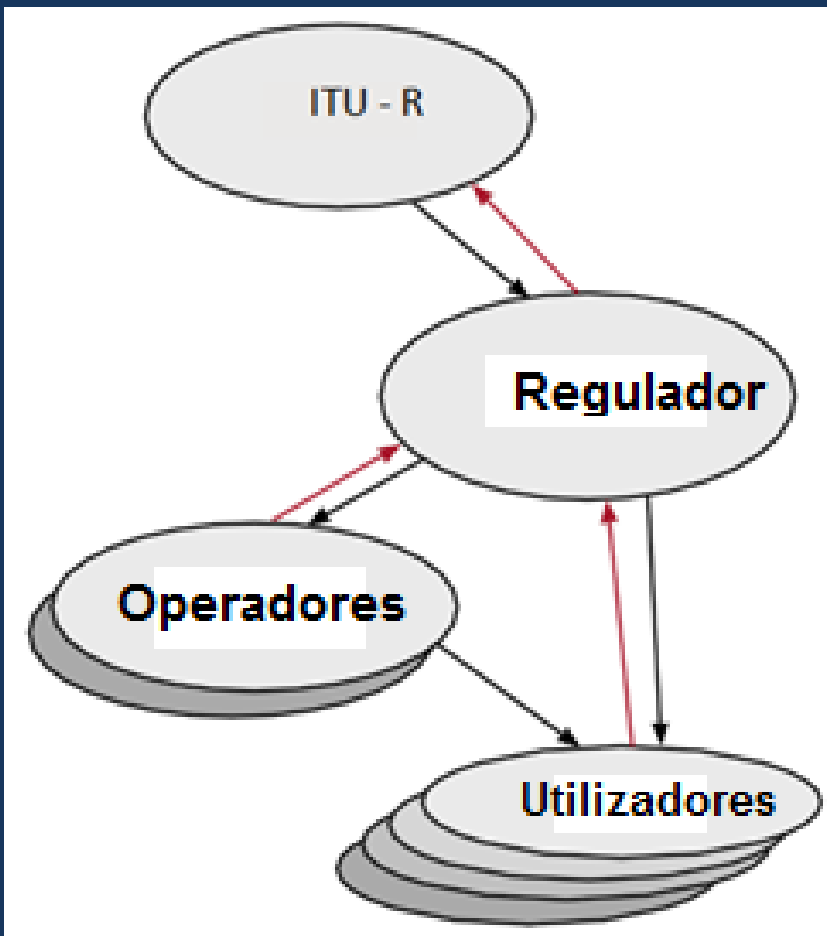




# Navigation and mobile satellite issues

- ◉ Interest in providing Radio Determination Satellite Service (RDMSS) in the band 2348.5 - 2500 MHz in region 1 (Europe, Africa) and upgrade in the same band to the region 3 (Asia).
- ◉ Increased use of Mobile Satellite Services, restricted by bandwidth problems (now 4 -16 GHz), decided to revisit the band 22 - 26 GHz at WRC15.

# Inter-systems coordination (through all entities involved)



- ◉ The ITU-R coordinates the International Spectrum use, preventing the Satellite Operator (SO) from having interference problems in its systems.
- ◉ Once implemented the “open sky” policy for a country , there will be no more additional licensing requirements to the SO, which is indeed strongly supported by the industry seeing the lack of definitions, as inefficiency.

# Regulatory Agencies (National and regional)



- ◉ CEPT - European Radiocommunications Office
- ◉ ETSI - European Telecommunications Standards Institute
- ◉ FCC - Federal Communications commission (USA)
- ◉ OFCOM (UK)
- ◉ ORTEL – Organo Regulador de las telecomunicaciones (GE)
- ◉ UAT – União Africana de telecomunicações
- ◉ ECOWAS - West African Telecom. Regulatory Assembly
- ◉ INACOM - Instituto Nacional Comunicações (Angola)
- ◉ ANAC - Agência Nacional de Comunicações (Cabo Verde)
- ◉ INMC - Instituto Nacional Comunicações de Moçambique
- ◉ ICGB - Instituto de Comunicações da Guiné Bissau

# Other Agencies

## International organizations

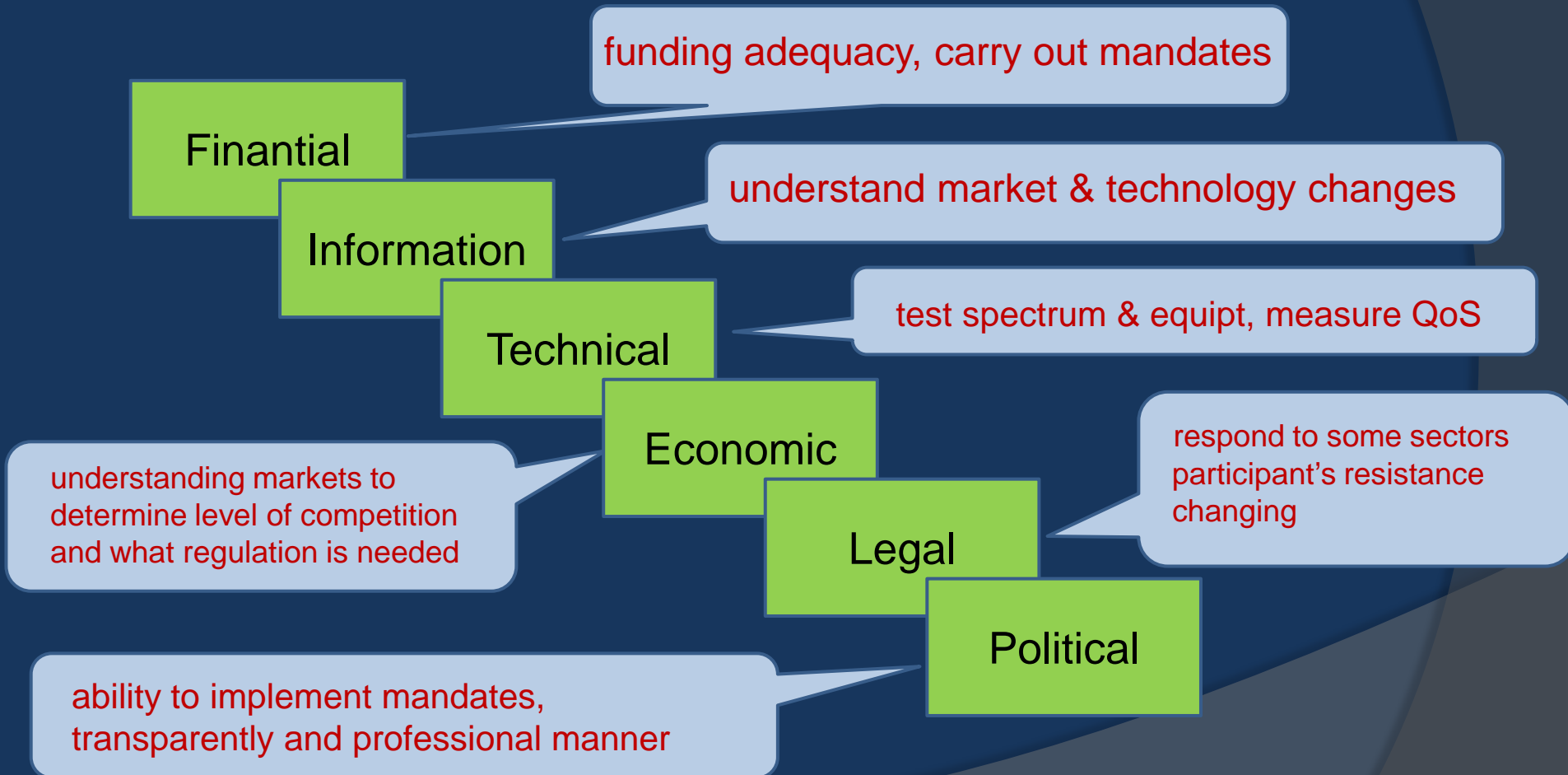


Designation	link
AFDB - African development bank	<a href="http://www.afdb.org">http://www.afdb.org</a>
ATU - African Telecommunications Union	<a href="http://www.atu-uat.org">http://www.atu-uat.org</a>
COMESA - Common Market for Eastern and Southern Africa	<a href="http://www.comesa.org">http://www.comesa.org</a>
RASCOM - Regional African Satellite Communications Organization	<a href="http://www.rascom.org">http://www.rascom.org</a>
SADC - Southern African Development Coordination Conference	?
WATRA - West African Telecommunications Regulator's Association	<a href="http://www.watra.org">http://www.watra.org</a>
CRASA - Communications Regulator's Association of Southern Africa	<a href="http://www.crasa.org">www.crasa.org</a>
PARENET – Pan African Regulator's Network	Electronic Communications
ESMT – École Supérieure Multinationale des Télécommunications	?

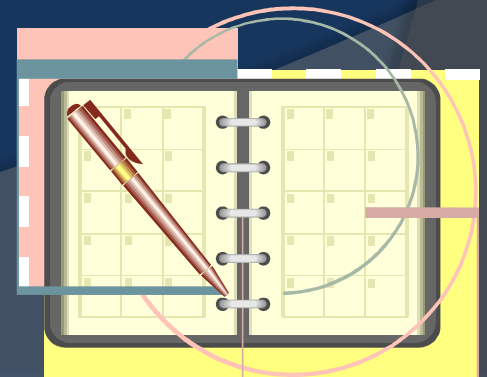
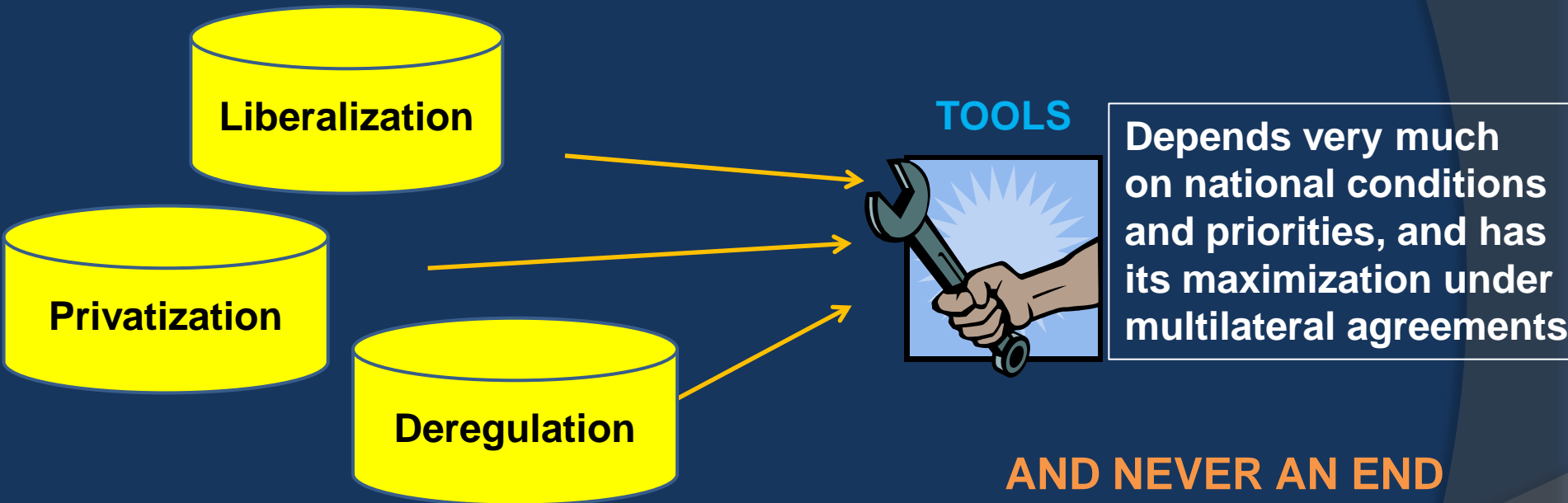
# Policy and regulatory Guidelines

- ◉ Radio Regulations Organizations
- ◉ Satellite policy principles
  - Non discrimination
  - Open borders
  - Transparency
  - Content and technology neutral
- ◉ Legal framework of satellite organizations
- ◉ Key regulatory and licensing trends
- ◉ Analog to digital TV

# Regulators Challenges



# Satellite Policy Principles





# Satellite Policy Principles and achievements



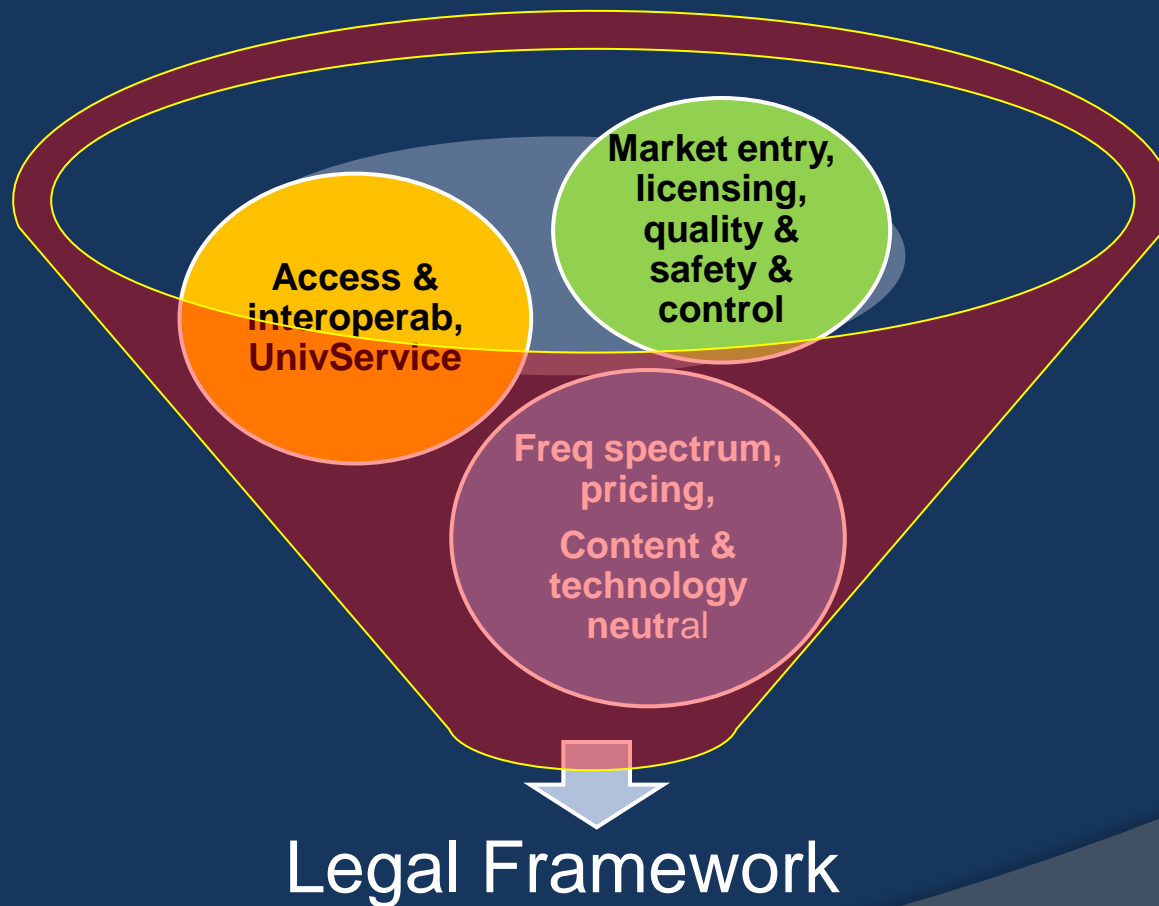
**Competition → lowering prices**  
**Expanding services**  
**Technical innovations**

**Define timeline,  
but keeping use of  
public resources (spectrum)**



**Transparency**  
**Fairness**  
**Consistency**  
**Less regulatory means  
more access to essential com.**

# Bottlenecks



Legal Framework

# Non discriminatory mkt entry 1

- ⊙ Restrictive regulatory procedures and unfavourable treatment on foreign SO, including burdensome licensing conditions
- ⊙ Requirements for unnecessary and duplicative national infrastructure
- ⊙ Changes in spectrum allocation decisions
- ⊙ Disparate fiscal treatment
- ⊙ High equipment importation, duties and requirements of national commercial presence

# Non discriminatory mkt entry 2

And even more subtle, as:

- ⊙ Designing (domestic rules) to favour only the development of national satellite market
- ⊙ Turning domestic SP towards using national SO, technical facilities, staff or
- ⊙ Prioritizing access to the market of government services to national SO only
- ⊙ Allegedly trying to support an implicit program of “universal access / service” for consumers, when the solution to the UA dilemma is not to restrict the number of independent service providers

# Non discriminatory mkt entry 3

## With direct impact on:

- ⊙ Ultimate choice of services (and costs ) that distributors can offer to end-users
- ⊙ Troubling cases where satellite coverage does exists today, but market access is denied
- ⊙ Undermining the up front investment made by SO and denies users in a given territory the benefits of satellite services that would otherwise be immediately available
- ⊙ Development a kind of “black market” in which non mainstream business, attempt to provide services and meet customer demands in violation of the government’s licensing requirements

# Open borders for competitive access

1. Make the provision of bare satellite capacity unrestricted.
2. Provide national treatment for foreign SO, favouring what is often referred as “open skies”.
3. Eliminate local entity / local presence requirements, e.g. satellite service providers should not be required to have a corporate presence in a country in order to provide services in that country.
4. Provide transparent, non-discriminatory authorization procedures, e.g. , if a satellite operator has already received a licence for its space segment from its home country and has co-ordinated the satellite through the ITU and abides by all relevant resolutions in the ITU Radio Regulations, then no duplicate licensing requirement should be imposed on the use of that space segment to provide services in any country

# Free access or “open sky policy”

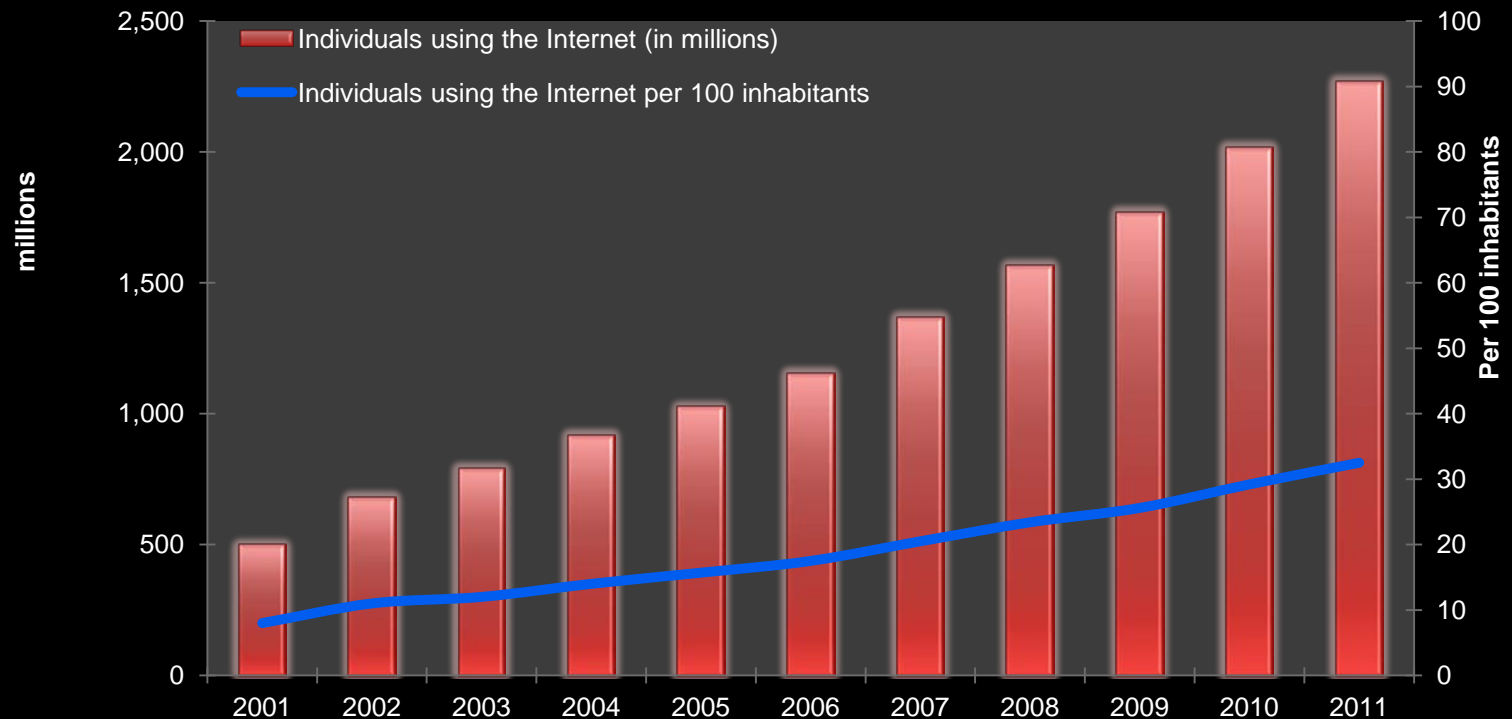
## *Trends in Telecom Reform 2009*

- ◎ Huge strides in ICT - Information & Communications Technologies service penetration, have been made over the last decade, with strong gains in all telecommunications services, particularly in mobile voice.
- ◎ The leading causes are the lower cost of deploying (...) networks and competition in prices and services in the vast majority of countries. (...)
- ◎ According to ITU, the number of Internet users worldwide more than tripled between 2000 and 2008.
- ◎ In developing countries, the increase was tenfold and continued growth is widely anticipated



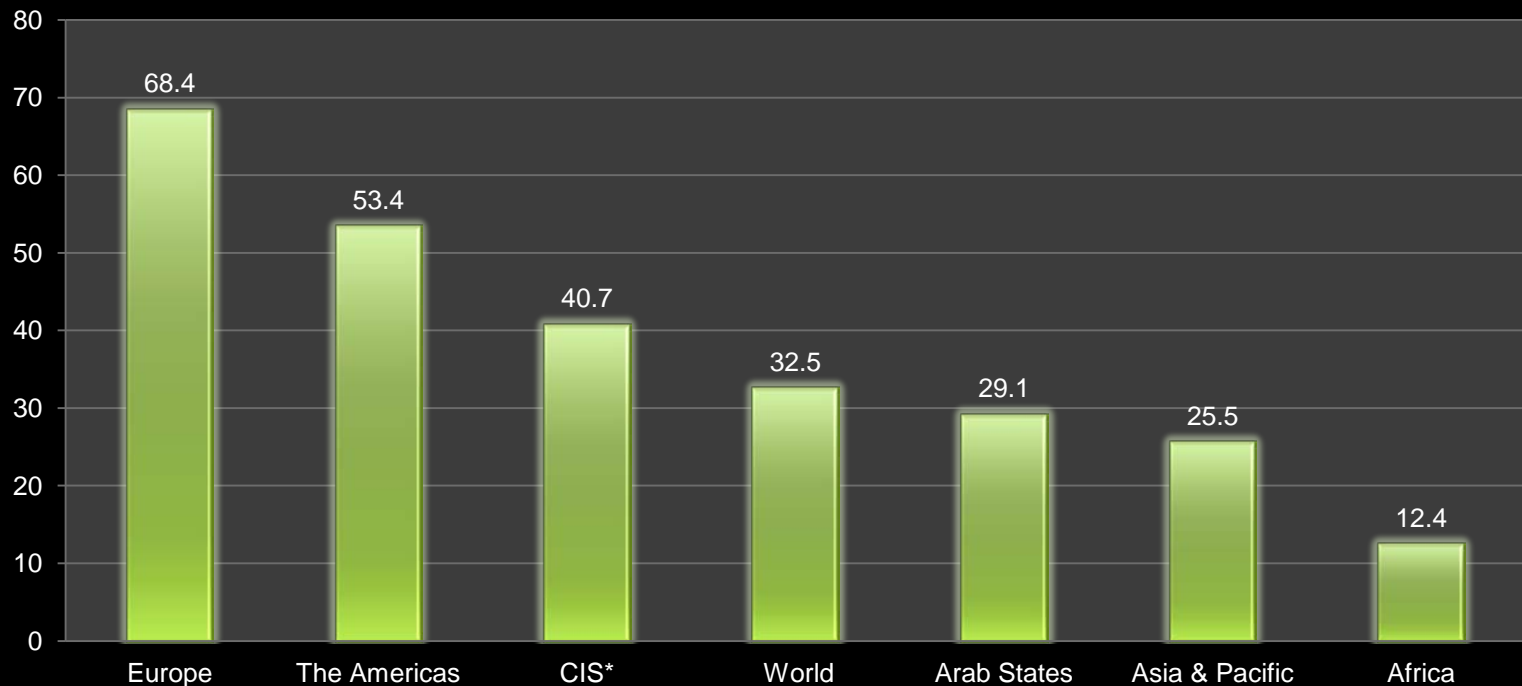
# Free access or “open sky policy”

**Global numbers of individuals using the Internet, total and per 100 inhabitants, 2001-2011**



# Free access or “open sky policy”

**Individuals using the Internet per 100 inhabitants, 2011**



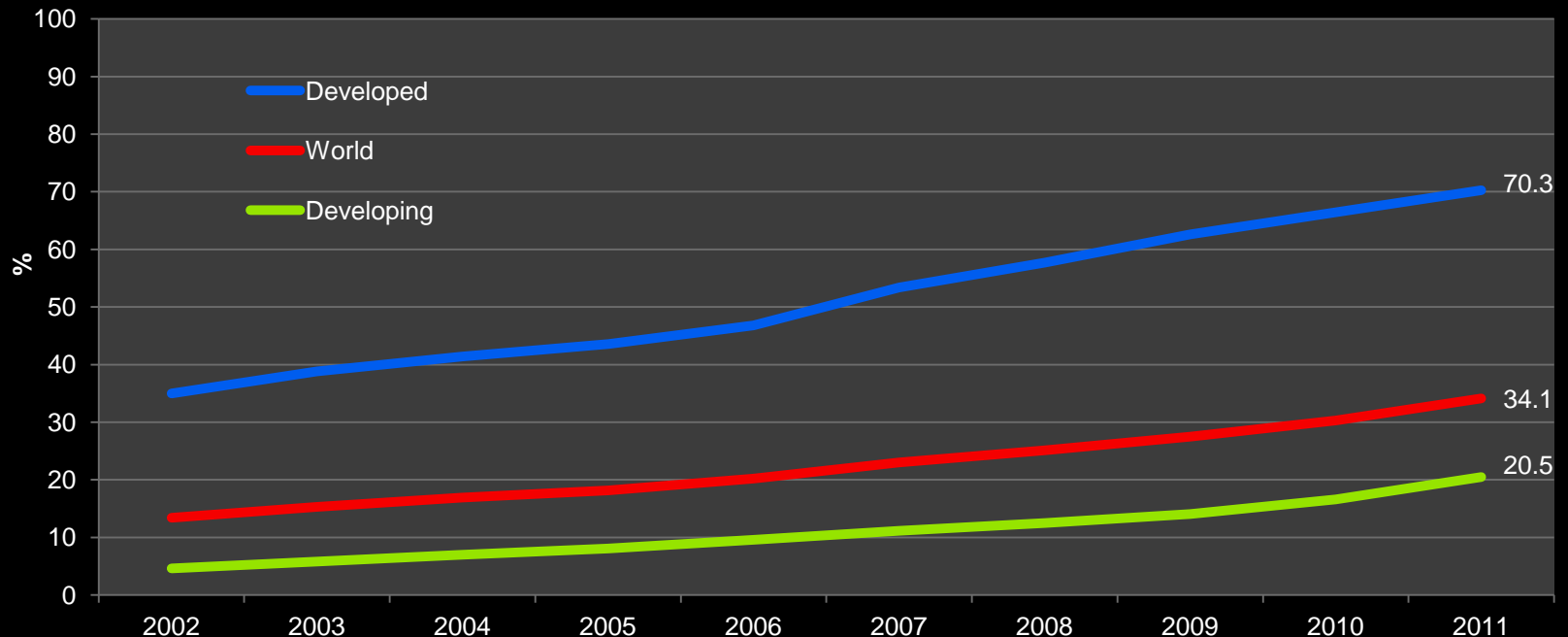
\* Commonwealth of Independent States

Regions are based on the ITU BDT Regions, see: <http://www.itu.int/ITU-D/ict/definitions/regions/index.html>

Source: ITU World Telecommunication /ICT Indicators database

# Free access or “open sky policy”

**Percentage of households with Internet access  
by level of development, 2002-2010**



The developed/developing country classifications are based on the UN M49, see:

<http://www.itu.int/ITU-D/ict/definitions/regions/index.html>

Source: ITU World Telecommunication /ICT Indicators database

# Opem Sky policy summary

- Flexibility on selecting among several suppliers
  - Incentive to competition among satellite operators
- meaning → More options at effective costs  
→ Anyone or any entity authorized on earth station operation may access directly to the satellite systems coordinated by ITU

# Transparency rules & policies

- ◉ Eliminate burdensome frequency coordination requirements, eliminate monopolies
- ◉ Allow free circulation and use of satellite consumer terminals
- ◉ Address security concerns adequately
- ◉ Regulators shall undertake publishing regularly their laws and regulations on satellite licensing, as well as licenses and authorizations. Making this information readily available - through Internet websites - is an extraordinary step in advancing transparency of a country's policies.
- ◉ Regulators should also use their own Diplomatic Services to respond to petitions from foreign satellite or network providers desiring access to their market.

# Content neutral regulations

- ◉ Due to (converged) common digital platforms, different types of content that, formerly were dedicated to specific industries can now be conveyed on different infrastructures, namely and ideally in the satellite world.
- ◉ Administrations that regulate “content” often apply those regulations to satellite operators....(ex. Call back services, private line resale, VoIP...)
- ◉ Restrictions on the number and types of international carriers that serve a country serve only to erode competition and raise prices for customers.

# Content neutral regulations

## So...what shall be the steps ahead

- ◎ To help subsidize and reduce the costs of local telecommunications services, some mechanisms can be maintained through the imposition of universal service fees on international carriers, or through interconnection requirements
- ◎ In any event, content restrictions that are imposed by a country should be technology - neutral - applying equally to satellite-based and wirelined telecommunications service providers



# Technology neutral regulations & licensing



**Should the rules and procedures be implemented towards an equal treatment (convergence) of different information and communication infrastructures (i.e. technology neutrality)???**

- ◎ In order to facilitate fair competition between technologies (wired or wireless), regulators must strive, to the extent possible, to make their regulations, licensing requirements and regulatory fees technically neutral
- ◎ In order to ensure that regulations are technologically - neutral, regulators should strictly limit their regulations and licensing requirements for satellite services, using them solely to
  - Protect the public safety and
  - Manage scarce public resources, such as frequency spectrum when there is more than a negligible risk of harmful interference.

# Policy and regulatory Guidelines

- ◉ Radio Regulations Organizations
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# Legal Framework - what is usual

- ◉ External support, due to big ammounts and technical knowledge involved, whatever be through a “technical co-operation program ...
- ◉ World Bank example, in terms of regulatory framework advocates separating governments’ policy and regulatory functions from telecommunications operations, namely:
  - Strengthening government’s capacity to formulate an oversee policy and
  - Creating a regulatory regime and institutions that emphasize competition while keeping regulatory intervention to a minimum

# Regulatory process 1

- ◎ Depending on the legal framework, regulators may issue different types of “regulatory instruments”, such as regulations, decisions, orders, decrees, rules, policies, notices.
- ◎ In general, the effect of these instruments is to make “decisions” that implement regulatory policies, resolve disputes, or deal with other matters within the regulators’ mandate.

# Regulatory process 2

- ◎ The principles of good regulatory decision-making are well known, namely, transparency, objectivity, professionalism, efficiency and independence.
- ◎ Two fundamental rules, are very very important and followed:
  - Hear the other side (*maxim audi alteram partem*)
  - Don't be a judge in your own cause (*nemo iudex in sua causa debet esse*)

# Regulatory process 3

## ► Why is it needed?

- ◉ To break up monopolistic powers
- ◉ To decrease burdens on entering competitors
- ◉ To prevent anti competitive activity
- ◉ To allow everybody's knowledge of *who, what, how and when*

## ► Shall include

- ◉ Licensing procedures
- ◉ Interconnection to public network
- ◉ Competition policy
- ◉ Transparencia e independencia de los reguladores
- ◉ Universal Service safeguard

# World Context 1 / 6

- ◎ 1st privatization & liberalization early 1980's (UK) , granted a variety of exclusivity rights, such as a limited monopoly for basic voice services and limitations on simple resale - **BT**
- ◎ Granted the license for **Mercury**, the first fixed-link competitor in the UK, contained a comprehensive regulatory code 1998



# World Context 2 / 6

- ◉ In the **United States and Canada**, detailed regulatory rules are typically contained in regulations, decisions, orders or tariffs made or approved by the regulator.
- ◉ Accordingly, **Canada** implemented a licensing regime for certain telecommunications operators for the first time in 1998, the regulator issued very short (2 page) licenses for international service operators

# World Context 3 / 6 (europeu)

- ◉ Issuing of, Regulations & Decisions (applicable across EU) and Directives, which each member state shall draw and apply in their national law
- ◉ Stating the basic principles for satellite com services and networks in the 80's, represents kick off
- ◉ Directive 94/46/EC liberalizes the satellite com, market according to basic principles of “green books”

# World Context 4 / 6 (europeu)

- ◉ Directive 97/13/EC defined two regulatory titles, license - case of scarce resources - and general authorization - lighter regulatory title, imposes more discipline in the medium. (no licensing requirements)
- ◉ Were still identified situations that should just be a simple request, without the need for licensing

# World Context 5 / 6 (Italiano)

## Kick off

- **Abolition** of exclusive and special rights
- **Liberalization of the satellite** telecommunication services (excluding voice services)

## Specific

- **Liberalization** of the commercialization of **satellite earth station** equipment linked (or not) to the telecommunications public network
- **Liberalization** of the satellite **space segment**

## Hands on

- **Issue of Authorization title** for undertakings willing to provide satellite network services
- **Issue of an Authorization title** for undertakings willing to provide satellite communication services

# World Context 6 / 6A (Mozambique)

**DM 115 / 1994**

**Authorisation and licensing of  
radiocommunications stations**



**Lei 32 / 2001**

**INMC - Post and telecommunications  
Regulation Authority**

**Lei 8 / 2004**

**Basic law in telecommunucations  
sector**

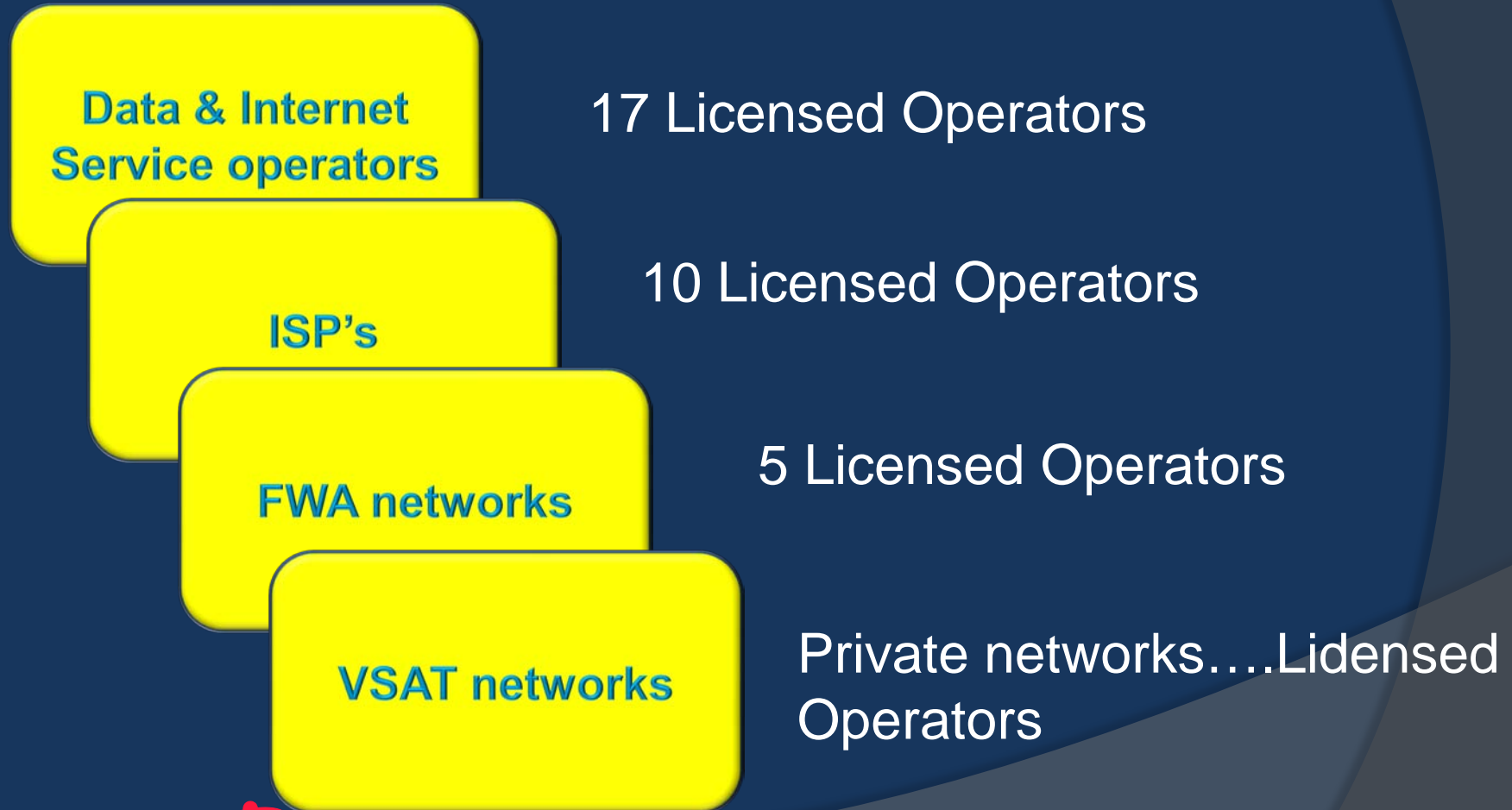


**Lei 36 / 2009**

**Radiocommunications regulation**

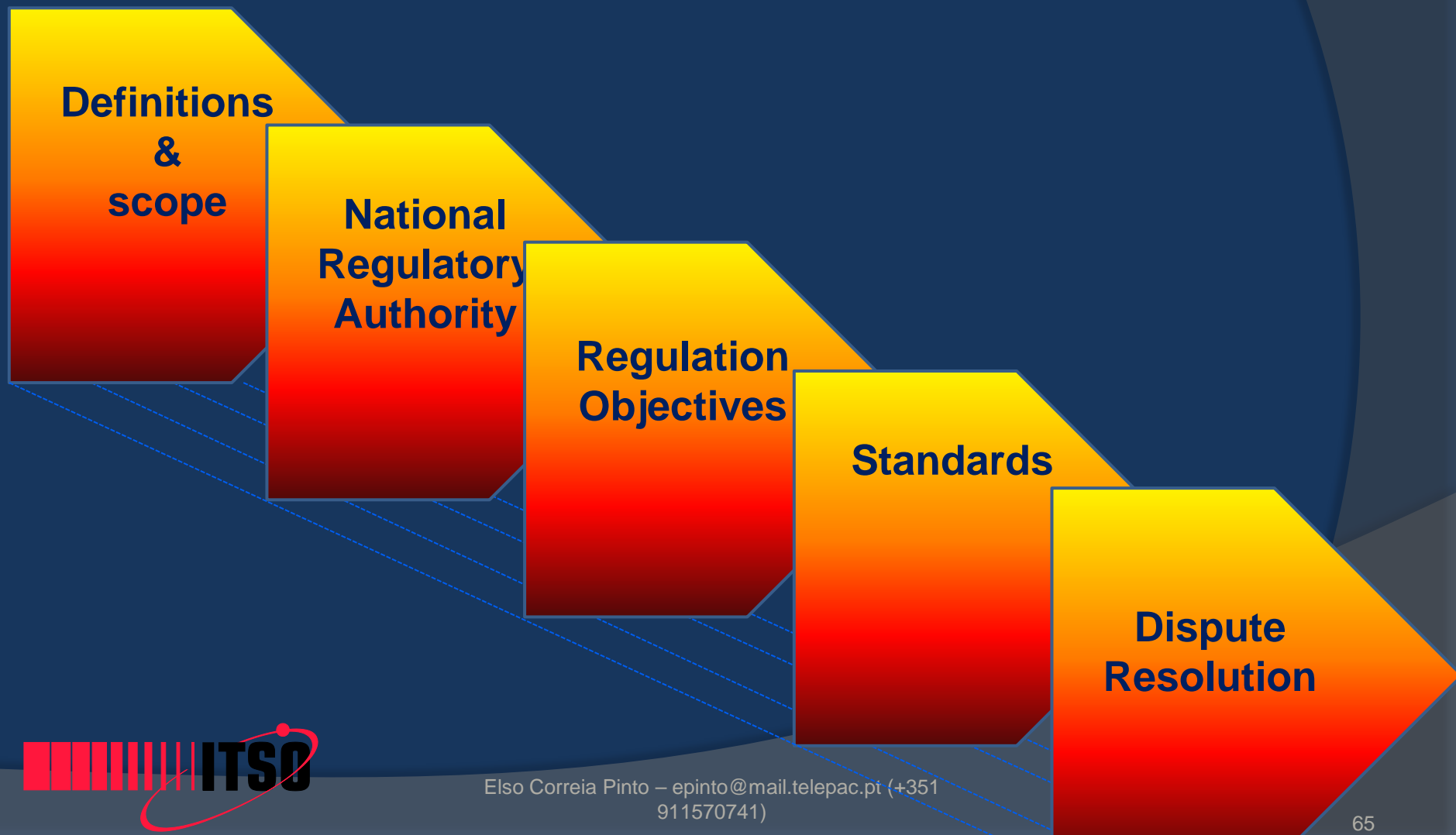


# World Context 6 / 6B (Mozambique)



# Legal Framework

typical format 1 / 7



# Legal Framework

## typical format 2 / 7



### Definitions & Scope

- ◉ Purpose of the framework, e.g establish harmonized framework
- ◉ Following Community of Inter-state agreement
- ◉ Definition of Satellite Network, Network Operator and Satellite Services Provider
- ◉ Definition of transnational markets Conditional access
- ◉ Definition of National regulatory Authority
- ◉ Definition of user, consumers .....
- ◉ Definition of Universal Service



# Legal Framework

## typical format 3 / 7



### National Regulatory Authority

- Inter-State members shall ensure that each of the tasks assigned to national regulatory authorities is undertaken by a competent body
- Independence of National Regulatory Authority shall be guaranteed by the Inter-State members
- Power shall be assumed with transparency and impartially.
- National Regulatory Authority and National Competition Authority shall provide each other information for the implementation of consumer law, on matters of common interest.
- Accounting separation and financial reports

# Legal Framework

## typical format 4 / 7

A large arrow pointing to the right, with a yellow-to-red gradient, containing the text 'Regulation Objectives'.

### Regulation Objectives

- ◎ National Authority shall ensure, non discrimination Market entry, open borderstransparent rules & policies and content and technical neutrality
- ◎ National Authority shall promote competition in the provision of electronic communic. networks, by:
  - ensuring that users, including disabled users, derive maximum benefit in terms of choice, price, and quality
  - ensuring that there is no distortion or restriction of competition in the electronic communications sector
  - encouraging efficient use and ensuring the effective management of radio frequencies

# Legal Framework

## typical format 5 / 7



### Standards

- ◉ In the absence of Inter-State standards members shall encourage the use of ITU, ISO or IEC standards.
- ◉ Licensing procedures with:
  - Standards forms
  - Type of service
  - Authorization title
  - Release time
- ◉ Interconnection public network
- ◉ Transparency and independency regulation
- ◉ Price and Universal Service secured safeguard (access)

# Legal Framework

## typical format 6 / 7



### Dispute Resolution

- ⊙ Resolution of cross border disputes
- ⊙ Harmonization procedures
- ⊙ Exchange and publication of information
- ⊙ Transitional measures
- ⊙ Dispute resolution, between undertakings
  - The decision of the national regulatory authority shall be made available to the public, having regard to the requirements of business confidentiality.
  - The parties concerned shall be given a full statement of the reasons on which it is based.

# Legal Framework

## typical format 7 / 7



Type of sat service	Regulatory	Authorization title	Release time
Satellite service Operator	Deliberation	Individual license	4-8 week
Vsat service provider	Deliberation	Individual license	4 week
Vsat broadcast service provider	Deliberation	No license, just information	1 week
Allocation of space segment	Deliberation	Individual license	2 week
Private satellite network	Deliberation	General authorization	4-8 week

# Policy and regulatory Guidelines

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- ◉ Key regulatory and licensing trends
  - Space segment
  - Earth station
  - Pricing
  - Enforcement
- ◉ Analog to digital TV

# Key regulatory & licensing trend

- ◎ Non-discriminatory licensing requirements provide a country with a useful tool to ensure **safety** and keep **up to date with technology** developments and demands
- ◎ Licensing requirements and their associated costs vary worldwide, but a **significant trend** has emerged toward adopting , publicly accessible licensing arrangements for **satellite network operators** and **service providers**
- ◎ Licensing of satellite services should be used solely for two purposes, to protect public safety and to manage spectrum resources in order to prevent unreasonable interference.

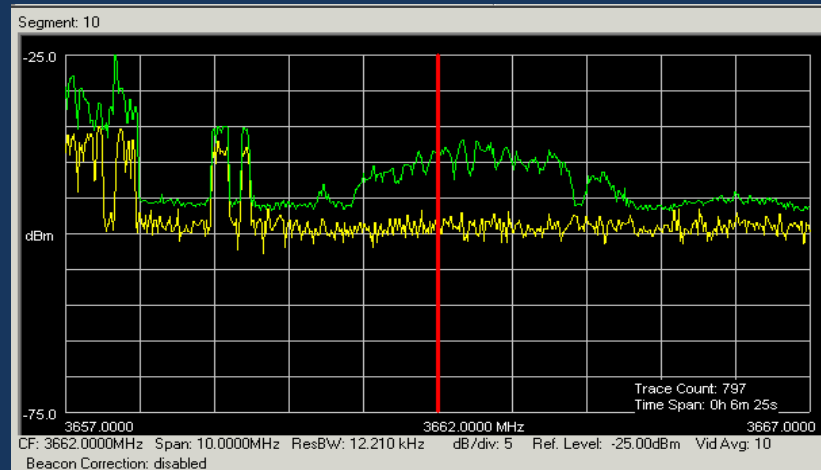
# Spacial segment

Landing  
rights  
(open sky)



2 areas focused

Specific  
frequency  
segments use





# Landing rights 1

- ◉ In the past, governments have developed policies to protect their countries' satellite systems, named **"Closed Skies"** policies, requiring service providers to use only locally-owned capacity when providing VSAT services.
- ◉ But (..) the "footprint" of a satellite - the region of the Earth served by a satellite - does not match national borders, making it necessary to regulate this matter through international agreements such as those developed by the ITU. This approach is referred to as **"Open Skies"** and is being adopted by most administrations in every major region of the world

# Landing rights 2



- ◉ Also, originally satellite operators such as Intelsat, Eutelsat and Inmarsat were inter-governmental organizations and owned by the PTTs and telcos around the world. Consequently, **in the beginning space segment could only be bought via the incumbent** PTT or telco.
- ◉ Nowadays, **“Open Skies” policies require satellite operators to compete for customers interested** in obtaining C-band, Ku-band and Ka-band satellite bandwidth. It has been proven that this competition can result in more options for local customers with a significant boost in quality and lower prices.

# Spectrum licensing 1



- ◉ The spectrum used via a satellite was historically distributed between the **incumbent, military and related public service** providers (police and emergency services).
- ◉ Today, the ITU coordination process safeguard avoiding technical problems such as interference among global operators. **Exclusive bands are often allocated for FSS and MSS services** and spectrum sub-segments are assigned to different operators through coordination.
- ◉ Accordingly it is not necessary to issue duplicate licenses to a foreign satellite operator because it has been coordinated and assigned by a foreign administration and no infrastructure is being installed or operated in the country.

# Spectrum licensing 2

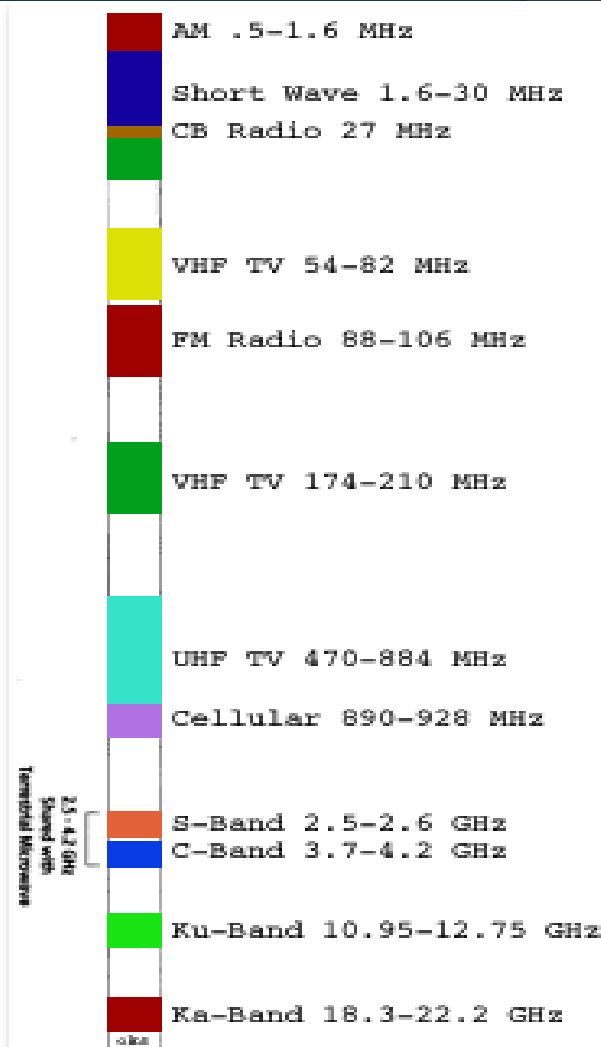
- ◎ In such cases, it is not necessary to issue duplicate licenses to a foreign satellite operator or the spectrum associated with the foreign satellite because it has been coordinated and assigned by a foreign administration and no infrastructure is being installed or operated in the country. Once inter-satellite co-ordination is accomplished at the ITU level, there is no further need to license spectrum use by networks operating in these exclusive bands.

# Spectrum licensing

## ex. Portuguese licensing case



SERVIÇO FIXO POR SATÉLITE (SFS)				
Entidade	Faixas de Frequências Tipo de ligação	nº de canais/tipo de utilização		âmbito de utilização
		Partilhado	exclusivo	
CPRM Contrato de subconcessão entre a PT e a CPRM Despacho MEPAT n.º 156/96 de 06-11-1996 Licença ICP-002/SRS	5925 - 6475 MHz Uplink	(1) (2)		g
	14 - 14,5 GHz Uplink	(1) (2)		g
	17,3 - 17,7 GHz Uplink	(3)		g
	3600 - 4200 MHz Downlink	(1) (2)		g
	10,95 - 11,2 GHz Downlink	(1) (2)		g
	11,45 - 11,7 GHz Downlink	(1) (2)		g
	12,5 - 12,75 GHz Downlink	(1) (2)		g
MAXITELSAT Licença ICP-003/RPT	5925 - 6425 MHz Uplink	(1) (2)		g
	14 - 14,5 GHz Uplink	(1) (2)		g
	10,95 - 11,2 GHz Downlink	(1) (2)		g
	11,45 - 11,7 GHz Downlink	(1) (2)		g
	12,5 - 12,75 GHz Downlink	(1) (2)		g



# Ground Segment



Satellite services provider shall have access to equip. locations



2 areas focusing



Network operator shall have access to equip.locations

# Network Operator vs Satellite Services provider

- ◎ Many countries require that public **network operators** hold licenses so that there is some quality assurance of the service being provided to their public, which in a few countries have also be adopted for private VSAT services.
- ◎ As VSAT it is not usually a public service, not usually connected to the PSTN, and can be privately owned, it is nowadays understood that this is a redundant licensing process - **satellite services provider** - that causes extreme time delays and confusion. The requirement for this type of license is declining,

# Individual Licensing vs Blanket Stations Licensing

- ⊙ Accordingly each network operator, should own a vsat license individually (per each terminal).
- ⊙ This strange environment ( 88's-90's EU legislation,) changed by 94's , allowing:
  - **Private operators to get licensing** and connection authorization to public networks, without being discriminated ( special rights off)
  - **Validation of “blanket licenses”**, which means technical criteria, solely - power level or eirp, frequency of use - so vsat networks ( $R_xO$ ,  $K_u$  and  $K_a$  band) with more or less terminals, would be exempted in a basis from individual terminal licensing requirements, provided that they meet specific technical criteria that assures adherence to recognised safety standards....



# Authorization Directive

## (on communications networks and services)



- ◉ Finally and under the terms of the new EU authorization Directive, the EU countries started implementing a “general authorization” system.
- ◉ As opposed to blanket licences - which are still administrative acts or explicit decisions - **general authorizations no longer require license** applications to be made prior to providing service or running a network.
- ◉ Administrations might require a notification, including basic information on the operator, the network location, the type of service provided, etc. However, the service can be offered under general authorization and cannot be put on hold awaiting a reply or consent of the Administration.

# Authorization Directive

(on communications networks and services)

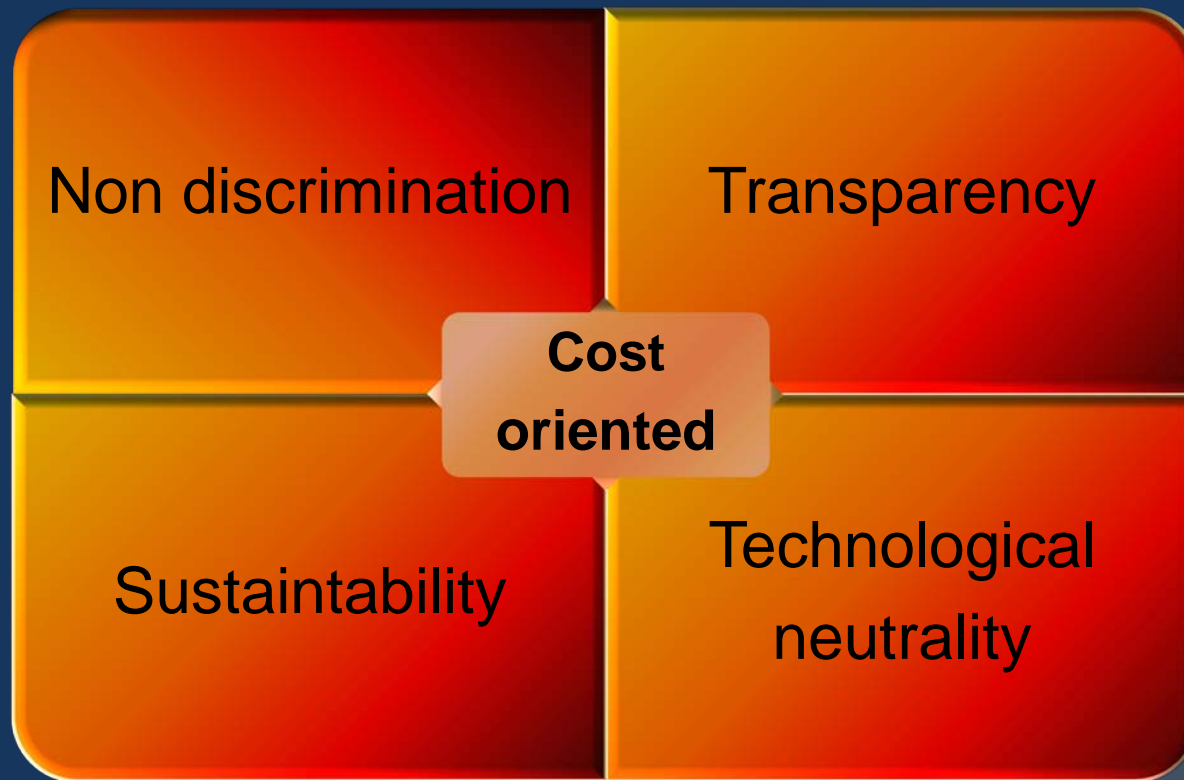


- General authorization also recognizes fully **the international nature of satellite services**, whereby there is no need to have a service provider located in each country. It overcomes, therefore, the difficulty of obtaining blanket licences in countries where a small number of terminals belong to several service providers, or where foreign ownership restrictions require the establishment of a national presence.



Faster services implementation  
Lower costs

# Establishing appropriate fees



# Establishing appropriate fees no discrimination

- ◎ **The principle of non-discrimination** should ensure that operators with market power<sup>note</sup> give fair treatment to other operators, service providers and consumers, and are not allowed to provide less favourable conditions to some parties for the same product or service.
- ◎ However, any operator may **differentiate offerings** and prices provided there are objectively justified conditions to do so.
- ◎ In addition to **publicising rules** regarding satellite licensing, fee structures should be clearly defined for the public without discrimination

# Establishing appropriate fees transparency

- ◎ **Transparency** -The Authorities should keep their procedures and decision making processes open to the public. The Authorities should also, whenever reasonable, consult all affected parties on matters that affect such parties. *Licensing fees* should compensate administrative costs to the regulator but *should not be used as a source of real profit for the government*.
- ◎ Operators should, in accordance with the regulators' requirements, provide transparent information that should be available to other companies and to the public

# Establishing appropriate fees sustainability 1

- ◎ **Sustainability** requires that prices be established in a manner that compensates efficient operators for their service provision; that is, operators should have an opportunity to be compensated sufficiently to remain as a going concern over the indefinite future with respect to their provision of services.

# Establishing appropriate fees sustainability 2



- ◎ Sustainability, however, does not require full compensation for inefficient or imprudent service provision, such as mandatory services.
  - In fact in some countries, governments and regulators have imposed mandatory service obligations, on newly licensed or newly privatized operators. These may include obligations to provide service throughout certain areas (especially for wireless operators). Being the most current mechanisms used to expand telecommunications networks in developing economies, they may kill the sustainability of small operators

# Establishing appropriate fees technological neutrality 1

A key objective of telecommunications sector reform is to promote **innovation**, particularly in the introduction of new services (technologies). The regulator must determine whether or not to subject new services to price regulation.

The principle of **technology neutrality** should apply, and will be assured if the application of the guidelines does not discriminate nor favours any specific technology, except to the extent that it will benefit the Community Members, users....



# Establishing appropriate fees technological neutrality 2



◎ To avoid confusion in the industry, the regulator may want to consider publishing a definition of a new service (technology) based on the criteria, such as:

- Does the new service include a new technology or functional capability?
- Does the new service replace an existing service and consequently not expand the range of services available?

# Establishing appropriate fees cost oriented

**Cost orientation** refers to the principle that the prices and charges for products and services should be oriented towards the underlying cost of providing them.

**Good price** regulation mimics the results of efficient competition. However, price regulation may have additional objectives, namely financing (on-going operations and future investments) efficiency (services be produced as efficiently as possible, that is by minimizing all inputs) and equity (fair distribution of welfare benefits among members of society)

# Enforcement 1 ?



**DOES  
THE  
PLAYERS  
(SUPPLIERS, USERS)  
OR  
REGULATORS  
NEED SECURING  
THE  
ENFORCEMENT OF  
LAW?**

- ◉ In a country where a business environment is able to return a modest, but predictable and consistent revenue stream, as opposed to a country where one company might receive an initially large, but unpredictable, risky and inconsistent revenue stream, how does the entrepreneurship behaves?
- ◉ And how does it behaves, if the sector is non discriminatory, transparent and highly predictable?

# Enforcement 2 ?

- ◎ A significant **gap** between supply and demand encourages the growth of non - mainstream businesses, means willingness to provide **services in non - compliance** with national laws and regulations, but
- ◎ Such non - mainstream businesses are **less likely to promote local economic development**, because they are less likely to create sustainable well-paying jobs and they often take measures to avoid payment of national or local taxes.

# Enforcement 3 ?

SO THE ANSWER TO INITIAL QUESTION IS CLEARLY YES, e.g. IT IS NECESSARY THE ENFORCEMENT OF LAW, because:

- ◎ Such laws and regulations should also prohibit government actions that are arbitrary or discriminatory.
- ◎ All mainstream telecommunications service providers would be willing to pay an annual licensing fee to provide satellite services in a country - as long as the fee is reasonable and consistent from year to year – where they feel law enforcement



# Analog TV to DTT

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