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# Technology Neutral Regulation:
*Letting Technology Take the Lead*

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**Unlocking Africa's potential**

**… one sector at a time**

# Pygma logo

Our logo represents the initials of Pygma
Consulting in both French and English.
It was designed to represent a key, in line with
our goal of unlocking Africa's potential.

# Our beginnings

- Member of Pygma Group which was founded in 2003 and is an into-Africa investment company;

- Pygma Consulting was started in 2007 and now has offices and staff in Joburg and Kinshasa;

- Team of engineers, economists, public policy analysts and lawyers with over 12 years of experience in ICT sector policy and regulations, from operator, government, regulator and consultant perspective

- Previous work on Universal Service & Access for the International Telecoms Union (ITU) and the World Bank, including Harmonised Guidelines of Universal Access and Service for the West African Telecoms Regulator's Association (WATRA)

- Consulting streams in ICT, governance and regulation, and new market development with a pan-African focus

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# Objectives of Discussion

- **Reasons for Regulation**
  - **Rationale**
  - **Key Principles**

- Challenges for Technology Regulation

- The Two Camps

- Convergence

- Technology Neutrality
  - Technologies
  - Spectrum Management

- The new Regulatory Paradigm

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# Reasons for Regulation in the ICT sector

- Meet National and Public interest Objectives.
- Ensure that consumer benefits are approximately safeguarded
- Promote commercial and economic sustainability of the sector
- Encourage investment and provide opportunities for new companies and investors to establish ICT businesses.
- Foster competition
  - Tariff regulation
  - Regulation of interconnection and facilities leasing
  - Prevent and punish anti-competitive behaviour
  - enforcement of fair and equitable competitive market principles, restraining the power of dominant suppliers
  - levelling the playing field for new entrants

- Implementing universal service/access mechanisms to ensure the widespread (and affordable) diffusion of ICT
- Managing the radio spectrum effectively to facilitate new entrants and new technologies,

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# Principles underlying regulation

- Independence

- Transparency

- Accountability

- Responsiveness to consumer and community demands

- Technology Neutrality

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# Regulatory Instruments

- Communications Industry Regulation is implemented through several mechanisms and is best implemented through an understanding of the roles of the Ministry, the NRA and the industry:
  - Primary Legislation (Government & NRA)
  - Self regulation (Industry overseen by NRA)
  - Co-regulation (NRA and Industry)
  - No regulation (Free-market)

- In most African countries, regulation is still being developed (generally less than 10 years old) and **primary legislation** is the key tool through ICT Policy, ICT Law and ICT regulations.

- In more mature regulatory environments self-regulation and co-regulation are practiced.

- Notwithstanding this, there are a number of **unlicensed but regulated** frequency spectrum bands, which demonstrate a flexible approach. There is also a move to using primary legislation to introduce technology neutral approaches.

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# International Obligations (socio-economic)

**Integral part of the global and African ICT community & as such technology regulation must be informed by commitments for example…**

**World Trade Organization**

- Obligations, if any, must be transparent, non-discriminatory, competitively neutral and are not more burdensome than necessary

**World Summit on Information Society (WSIS)**

- Ensure ICT connectivity to public access points including *Educational and Health facilities, Government departments and libraries*
- Access to radio and television coverage
- Development of relevant local content
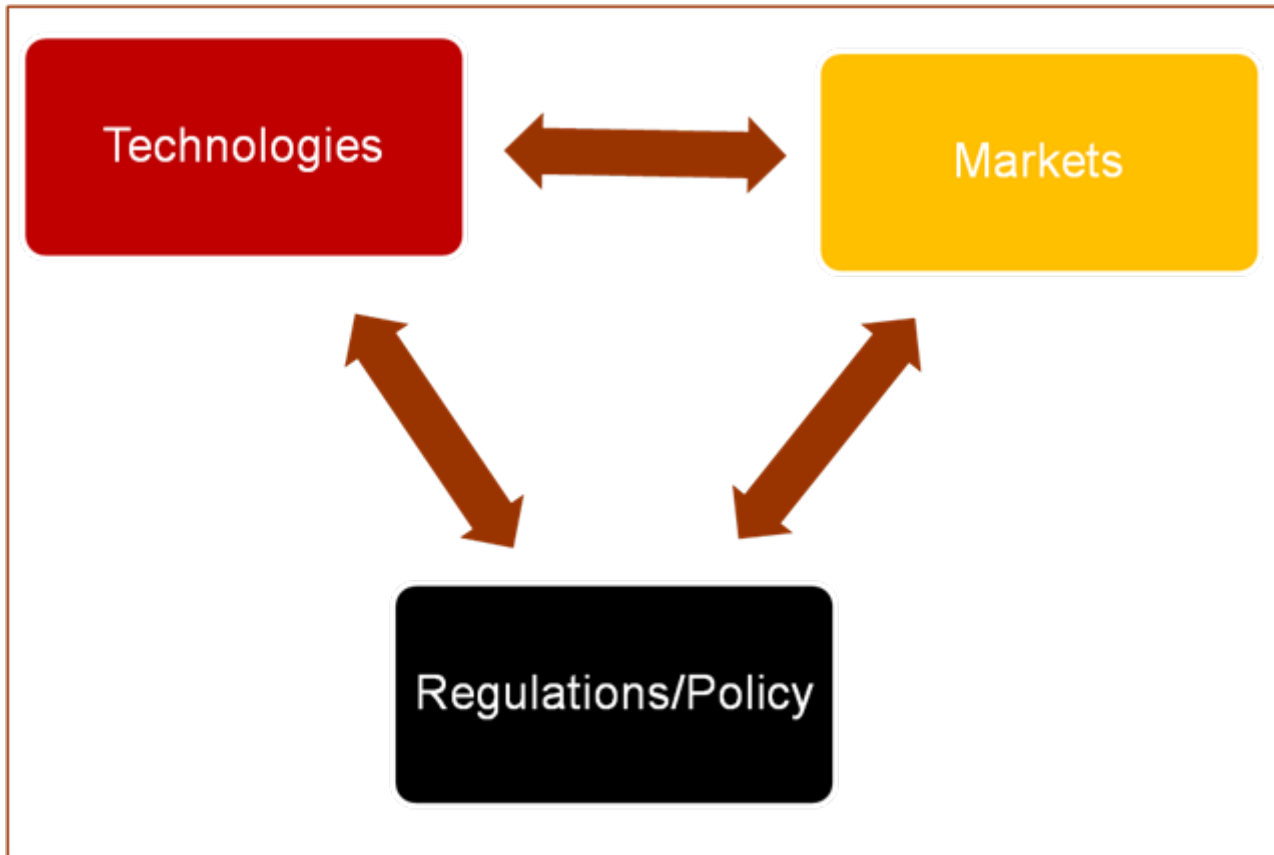
**Millennium Development Goals**

- Increase percentage of access to fixed and mobile telephones and computers

**New Partnership for African Development**

- Connection of Health and educational facilities, particularly clinics and schools
- Public broadcasters to play a greater role in health literacy

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# Forces that Shape Telecoms/ICT Development

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# Challenges to Regulation of Technology

- Major technology developments recently include:
    - Mobile
    - NGN
    - Internet
    - Convergence
    - "Disruptive" Technologies such as VoIP, WiFi, WiMAX, etc

- The challenge for regulators and policy makers is to:
    - "Keep up with technology"
    - Obtain the financial and human resources to effectively monitor technology
    - Ensure stability of the industry
    - Protect consumers
    - Balance the interests of industry, but **in the public interest**

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# The 2 Camps / "Heads"

**HEAD A**

1. Grew in the traditional Telcos and want to resolve problems with dependable hardware techniques with rigorous quality control.
2. Align with UN and ITU
3. Prefer closed communities and "boys" club
4. Pay for quality
5. Prefer strong regulatory involvement
6. Think: "Lets steer/control future network evolution"

**HEAD B**

1. Young and old 'trend setters' who are connected to the worlds of computers to the internet and believe in flexibility and adaptability.
2. Aligns with open forums like IETF
3. Individuals want to be active participants
4. Expect technology and delivery to be cheap
5. Want an open and unregulated playing field
6. Think: "Let's us see how this network evolves itself organically"

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# Convergence

- At a technology and service level it is the coming together of:

  - **Fixed-Mobile:** future distinctions will be between types of mobility in a single network, user terminal and services
  - **Telcoms-internet:** related infrastructure, regulatory and business model convergence
  - **Services and Applications:** telecom, computing, information, entertainment and broadcasting
  - **Technology and infrastructure:** common switching and transmission

- Also represents the coming together of :
  - **Business models** (fixed, mobile, broadcasting, etc)
  - **Regulatory frameworks** (telecom, broadcasting, IT, even postal)
  - **Bodies of knowledge and practice**

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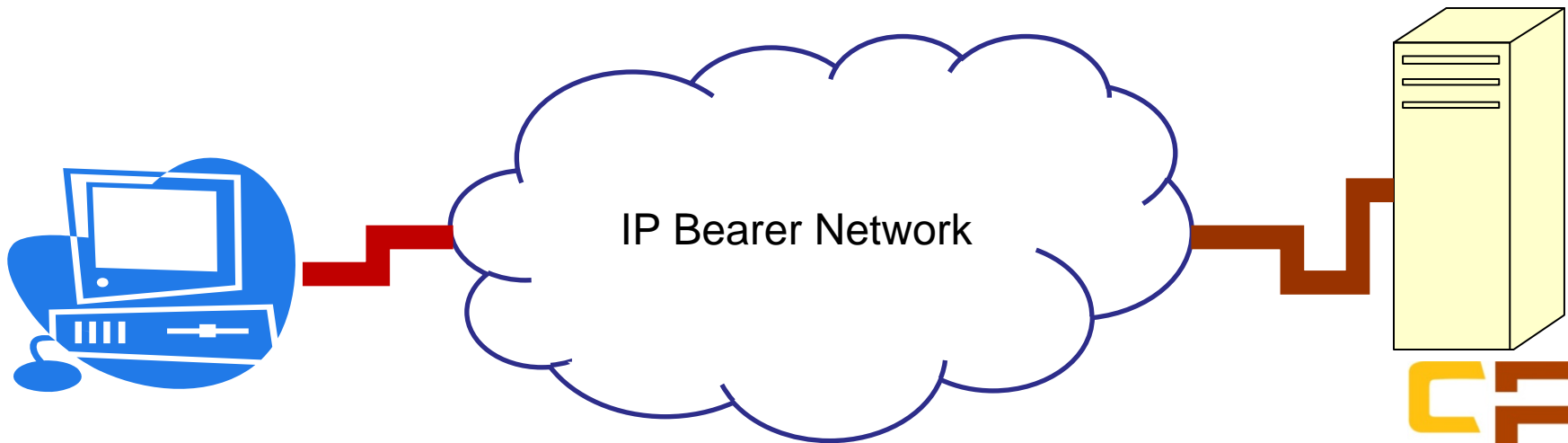
# Features of Convergence

- **Multiservice:** Multiple services, new or formerly separate, are supported on single set of facilities

- **Multifunction:** Multiple services are supported on a single terminal

- **Interworking:** Facilities interwork to perform or extend functions

- **Versatility:** The same service of content can be delivered by different types of infrastructure or media.

- **Composition of services or content:** exploiting multiple services (content types) for more powerful services (complex content).

- **Points of integration:** diverse equipments can work into a single common standard interface to supporting facilities.

- **Layering:** More than abstractions – give separations for business and regulation

- **Technology Neutrality:** designing applications independent of implementation technology – allow multi-platform incarnation

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# Telco Intelligent Network Paradigm
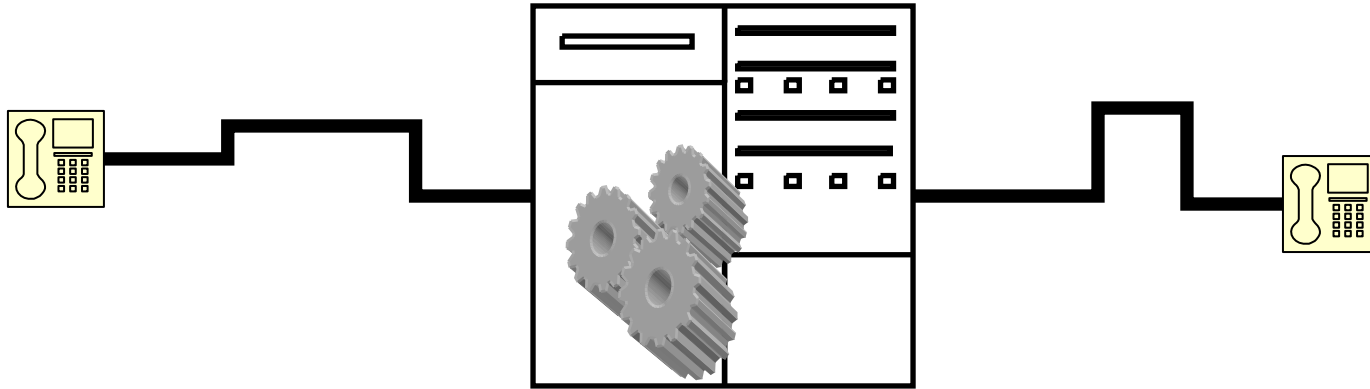
# Internet Service Paradigm

IP Bearer Network

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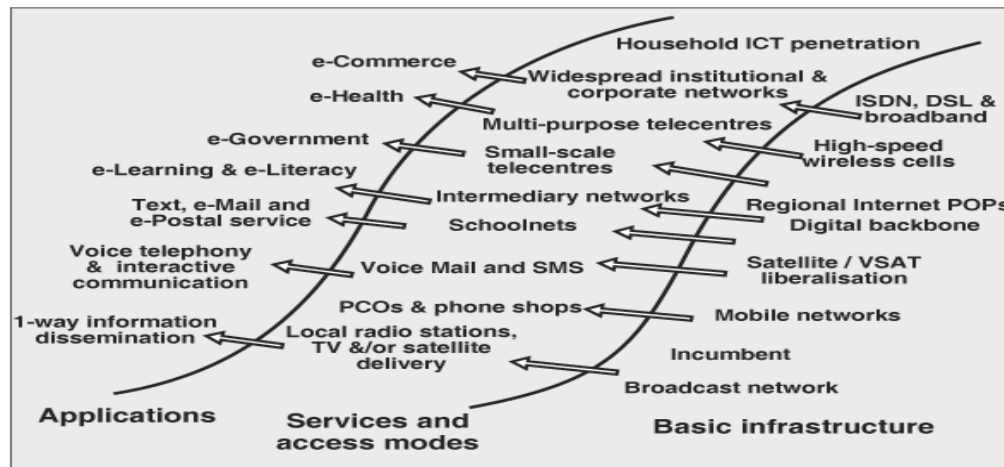
# Drivers of Convergence

- Technology
- Markets
- Customers
- Regulation

**Techno-economic Drivers**



*Increasingly Broadband is key to delivering these services and applications*

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# Technology Neutrality

- The concept " Technology Neutrality" is one of the key concepts which underpins the new regulatory paradigm for Electronic Communications Networks.

- The aim of technology neutrality is to ensure that applications of different technologies compete fairly on the basis of their comparative advantage.

- The idea is to create an environment that the choice of technology solution is left to companies themselves. Regulators must however still manage spectrum, a scarce national resource.

- Proponents of technology neutrality argue that regulations need to seek for competition between technology solution in stead of "pick a winner".

- Technology convergence will facilitate more competition because new network and services can enter the markets which was previously services by technology solution.

- Harmonised licensing is a hallmark of technology neutrality making it easier for investors to enter the market.

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# Technology Neutrality and RF Spectrum

- Radio Frequency (RF)  is an integral part of networks

- New applications create new spectrum needs

- New technologies (Digitization) enable efficient use of the RF Spectrum

- New technologies allow for the productive use of higher bands
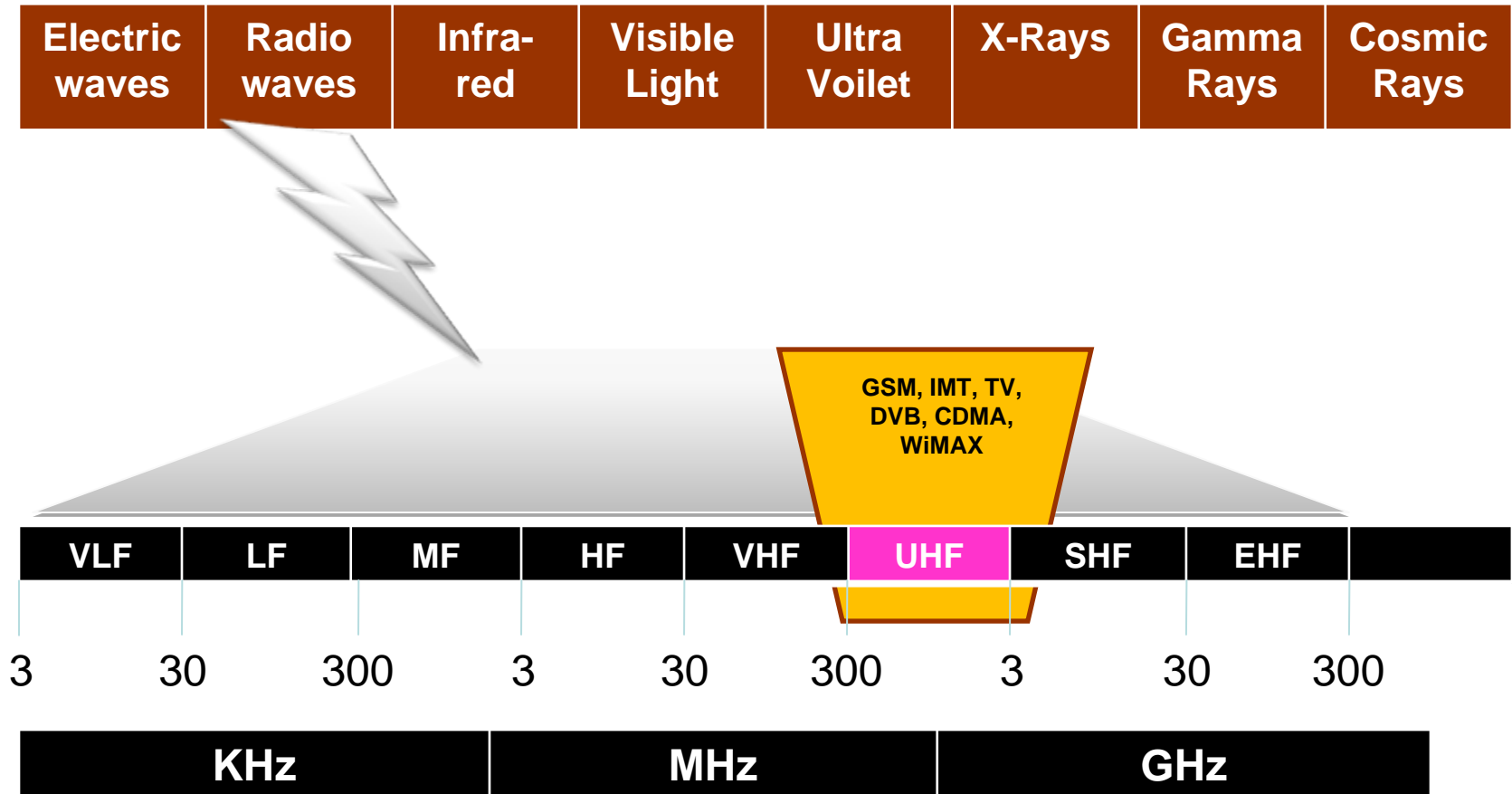
- Spectral efficiency is enhanced

**As a result**…..

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# Technology Neutrality and RF Spectrum (2)

**As a result…..**

- Reservation of Frequency bands becomes less important

- Spectrum reallocation or re-farming is and will become a prominent feature of spectrum management now and in the future.

- Regulators will have to understand emerging technologies such as SDR, Smart Antennas, cognitive radio, wireless mesh networking to develop an appropriate regulatory environment  to enable future developments.

- Regulators have to understand the use and quality of the spectrum

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# RF "Sweet Spot"

| Electric waves | Radio waves | Infra-red | Visible Light | Ultra Voilet | X-Rays | Gamma Rays | Cosmic Rays |
|---|---|---|---|---|---|---|---|

**GSM, IMT, TV, DVB, CDMA, WiMAX**

| VLF | LF | MF | HF | VHF | UHF | SHF | EHF |
|---|---|---|---|---|---|---|---|

| 3 | 30 | 300 | 3 | 30 | 300 | 3 | 30 | 300 |
|---|---|---|---|---|---|---|---|---|

| KHz | MHz | GHz |
|---|---|---|

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# The New Regulatory Paradigm (1)

- "Converged regulatory frameworks" are being implemented across Africa, and have been developed in several other countries, including
  - Nigeria, Tanzania, Uganda, South Africa, (Africa)
  - United Kingdom, Malaysia,

- Technology neutrality is based on convergence. Similar services can be provided on different technology platforms  - an issue for regulators used to regulating  technology (eg GSM licensees, Fixed licensees…).

- Under the new regulatory frameworks NRAs are obliged to examine markets not services to determine whether or not it is appropriate to be subject to regulation.
  - The will increase the possibilities for: transiting from  sector specific to general competition regulation
  - Transiting from technology specific regulation to technology neutral regulation.

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# The New Regulatory Paradigm (2)

- In regulation, the concept technology neutrality means that different technologies offer essential different services should be regulated in a similar manner.

- This applies to universal service access, competition regulation, RF regulation

- Different approaches/ interpretations are taken in different countries, it is therefore important for (potential) investors to:
  - Understand the policy and regulatory framework and the rationale for regulation
  - Follow technology developments
  - Engage the regulator – dialogue is key!

- Regulators must consider the public interest and socio-economic impact of new technologies, and the role of ICT in fostering development

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# Thank you!