Spectrum Management: Strategic Planning and Policies for Wireless Innovation

Spectrum policy debate-changes, issues and reform

Place: Algeria

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Introduction to Session 3

In this session, we will review several key themes in Spectrum Policy Reform which have greatly influenced how spectrum management has responded to these changes.

Session Objectives

- Review of the key external challenges and issues faced by spectrum policy makers and spectrum planners.
- Gain insight into how these challenges and issues have had varying degrees of influence in different regions.

Module Topics

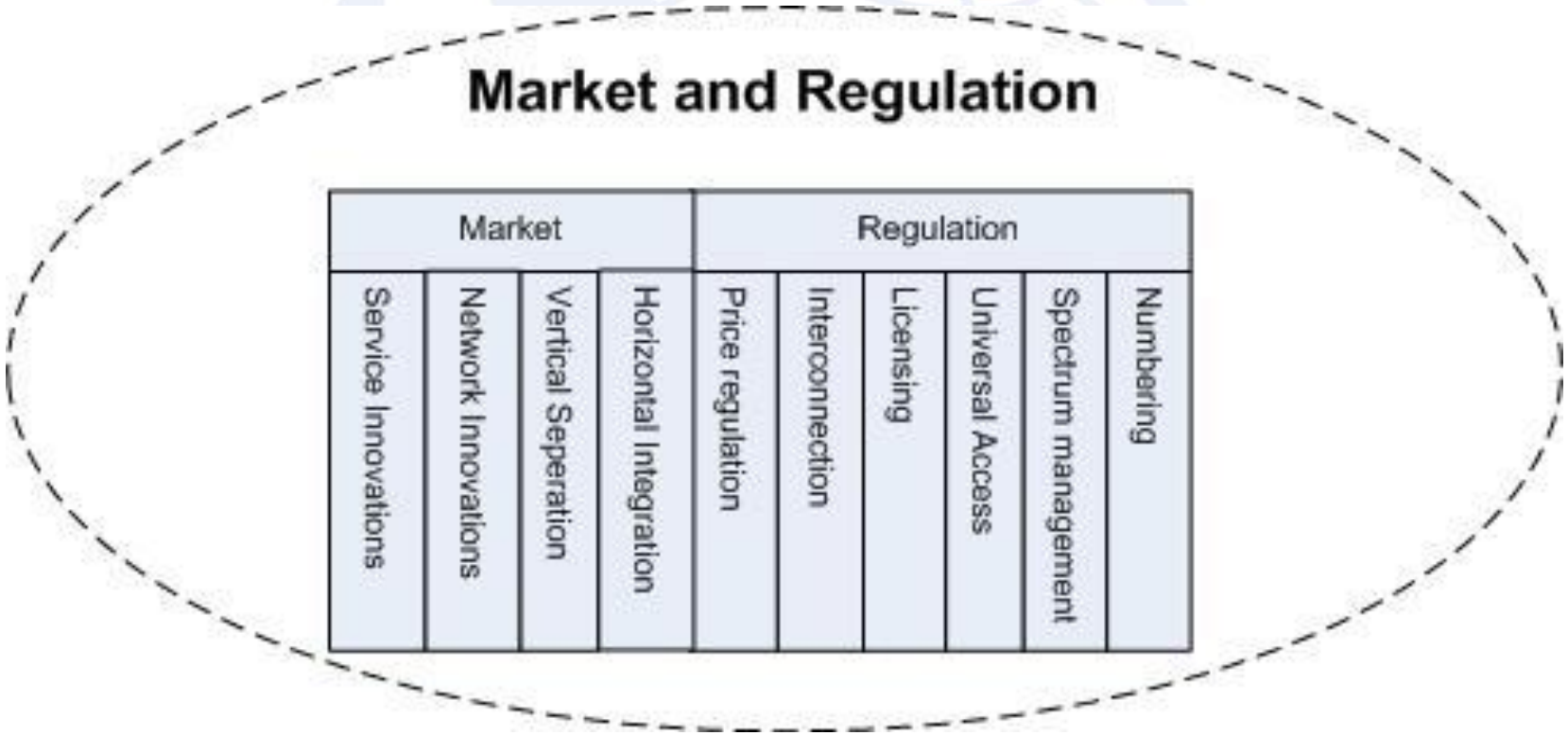
- Liberalization
- Globalization
- Convergence
- Technology and Service Flexibility (neutrality)
- Administrative vs. Market-based Spectrum Management
- Institutional Redesign

Pressure to Review and Reform

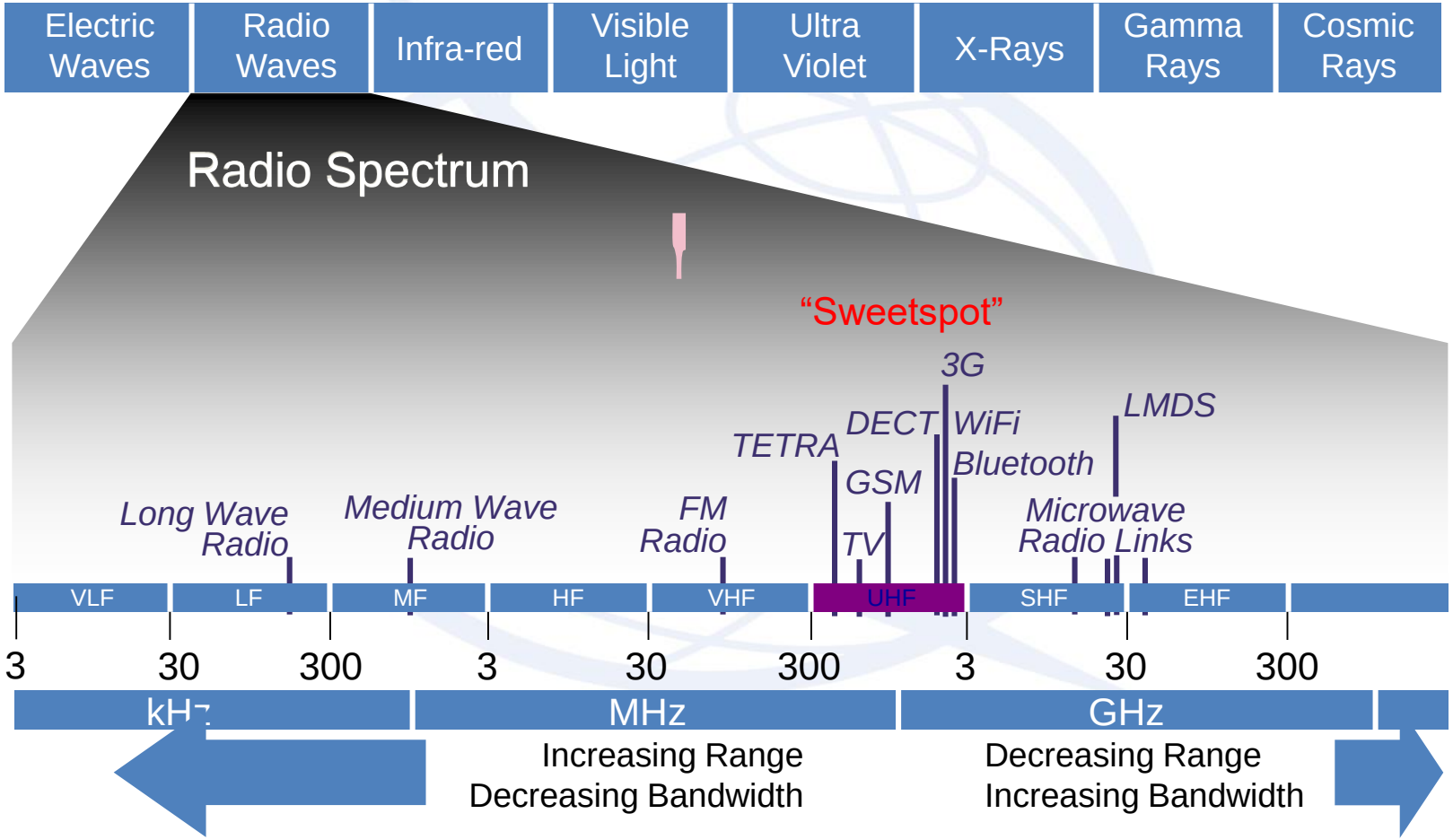
- In the past decade, significant challenges to the traditional approach to spectrum management emerged which generated new ideas in theory and practice.
- Two main themes are:
  - Uses for and demand for spectrum have grown significantly.
  - There was a growing consensus, at least in more developed markets, that traditional spectrum management practices heavily influenced by a concern for avoiding interference had delayed the introduction of new technologies and resulting beneficial services.

Challenges of emerging technologies

- The impacts of technology trends on regulation are either direct or mediated via their impact on market conditions



The Radio Spectrum



Comprehensive spectrum management is needed to maximize efficient use of spectrum

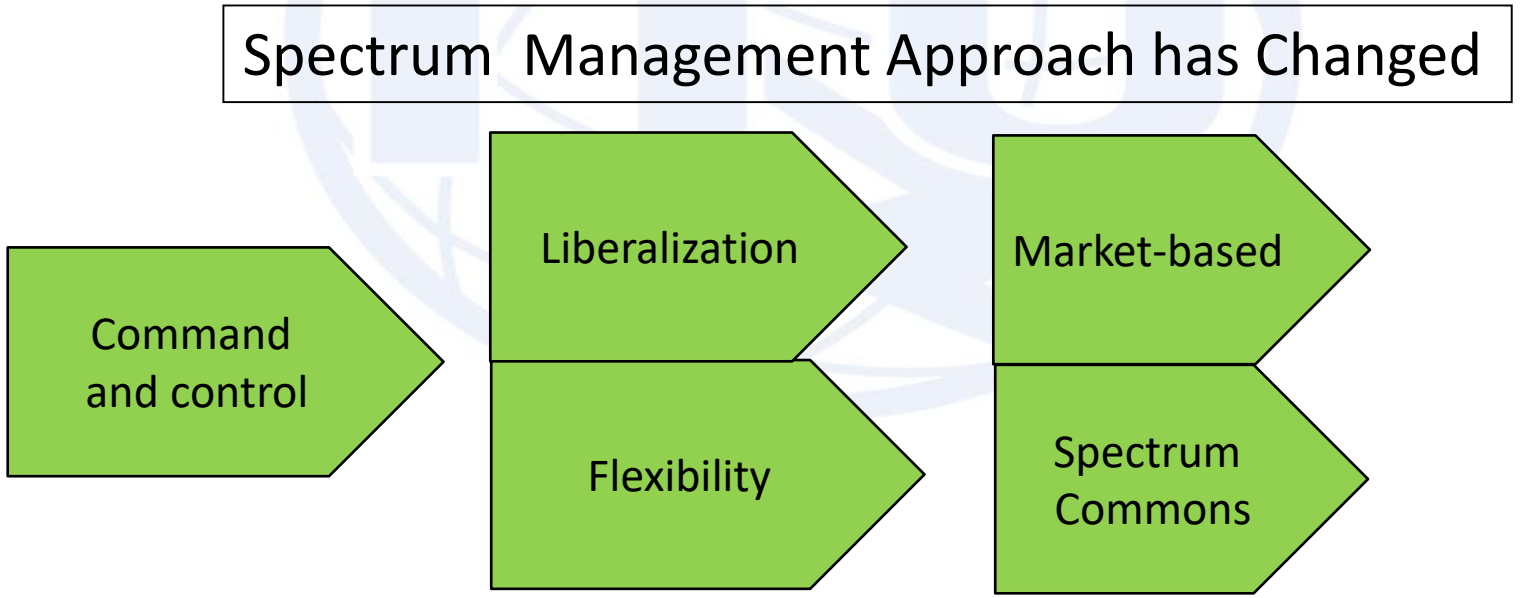
Old Spectrum Approach	Liberalized Spectrum Approach
• Administrative allocations and assignments • Regulator makes most decisions • Maximize auction revenues	• Flexible and market-based spectrum allocations and assignments • Cost effective flexible regulation • Changing technology will change the way spectrum used, requiring more flexibility – dynamic spectrum access, spectrum commons, etc. • Ensure unused spectrum made available quickly to maximize efficiency • Use broad range of regulatory tools to ensure spectrum efficiency

→ Higher market value for consumers and investors (broadband sales)

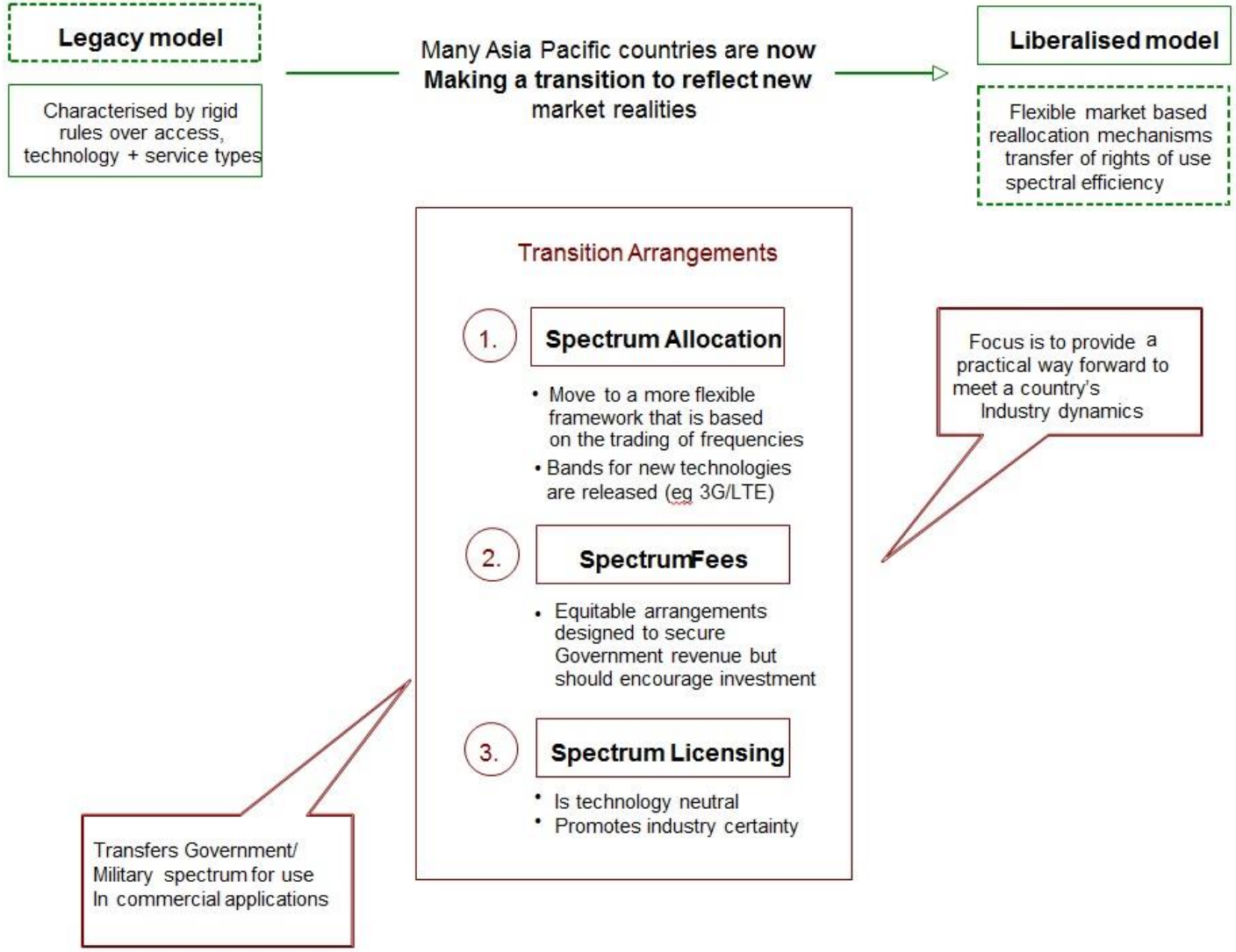
→ Higher long value for government (increased broadband access, GDP growth, taxes – less focus on auction revenues)

Transition to more flexible access and use

- Maximizing consumer value requires more flexible spectrum management
- Technology changes such as Dynamic Spectrum Access will force more flexible approach to allocation and assignment



Transition to market based liberalized spectrum management models



Source: *Windsor Place Consulting, 2010 from Guidelines for the preparation of national wireless broadband master plans for the Asia Pacific region, ITU-R, 2013*

What Should Guide a Change in Approach?

- Generally, the goal is to improve access to spectrum by giving users greater flexibility in its use. Several ways to do this:
  - Implement a new paradigm for interference protection;
  - Implement new methods for assigning spectrum rights.
- Spectrum policy must evolve towards more flexibility and market oriented models to increase opportunities for efficient spectrum use.

Core Spectrum Policy Principles

- Allocate spectrum to highest value uses to maximize benefits to society
- Technology flexibility and service neutrality
- Mechanisms to encourage highest value use
- Use least cost and least restrictive approach to meet spectrum management goals
- Promote certainty and flexibility
- Balance cost of interference with benefits of greater spectrum utilisation
- Harmonize spectrum use internationally and regionally to increase access and economies of scale
- Transparent, fair, and timely processes

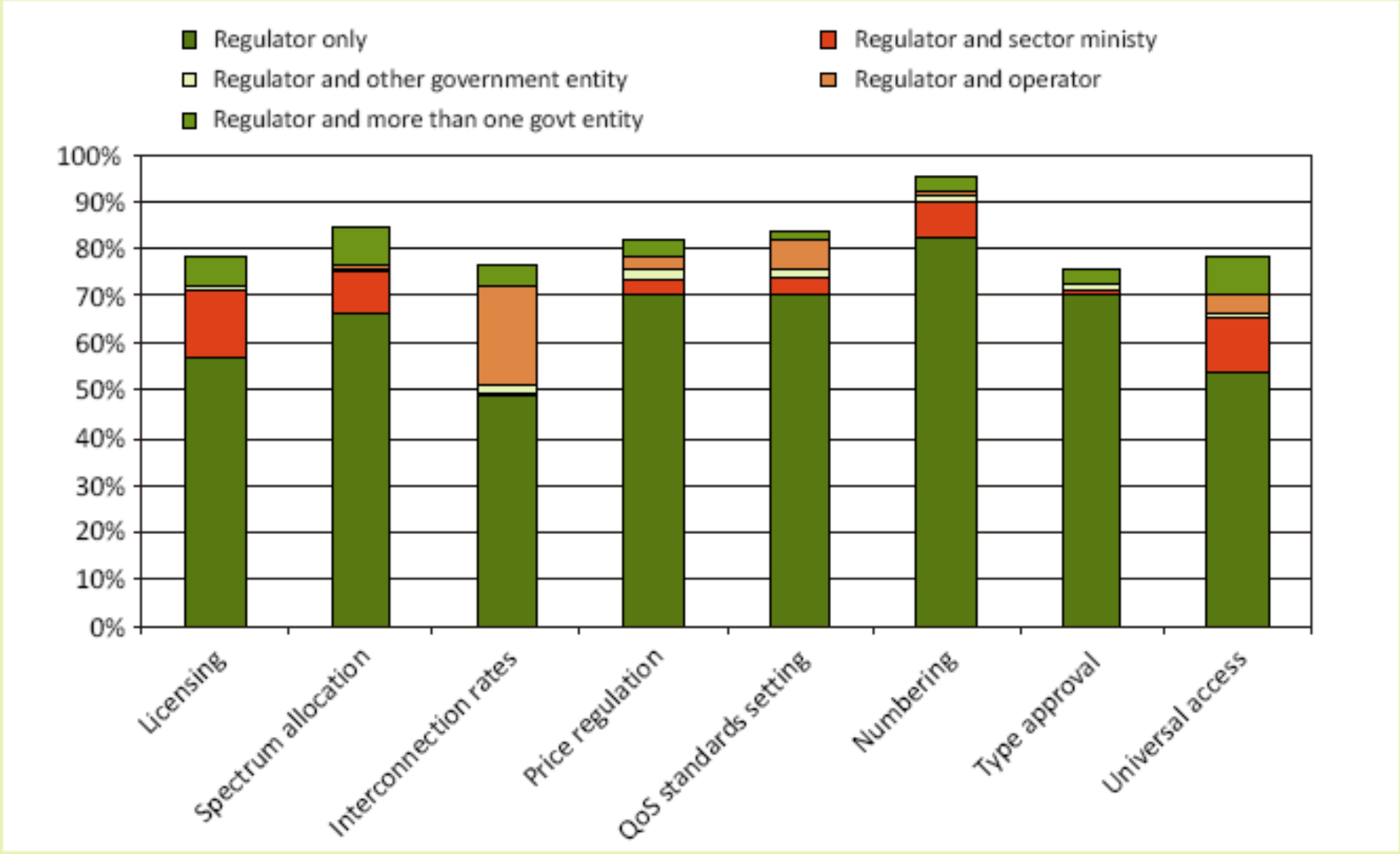
Technology Driven Policy Changes

- Technological advances are enabling changes in spectrum policy challenges;
- Increased use of digital technologies:
  - Increase potential throughput information
  - Digital signals and techniques are more robust and resistant to interference;
  - Development of software –defined radios;
- Technology advances create potential for radio systems to use spectrum more intensively and to be more tolerant of interference.
  - Implement new paradigm for interference protection
- Many portions of spectrum are not in use for significant periods of time. Additional measurements are needed to quantify and characterize spectrum usage and availability.

Institutional change

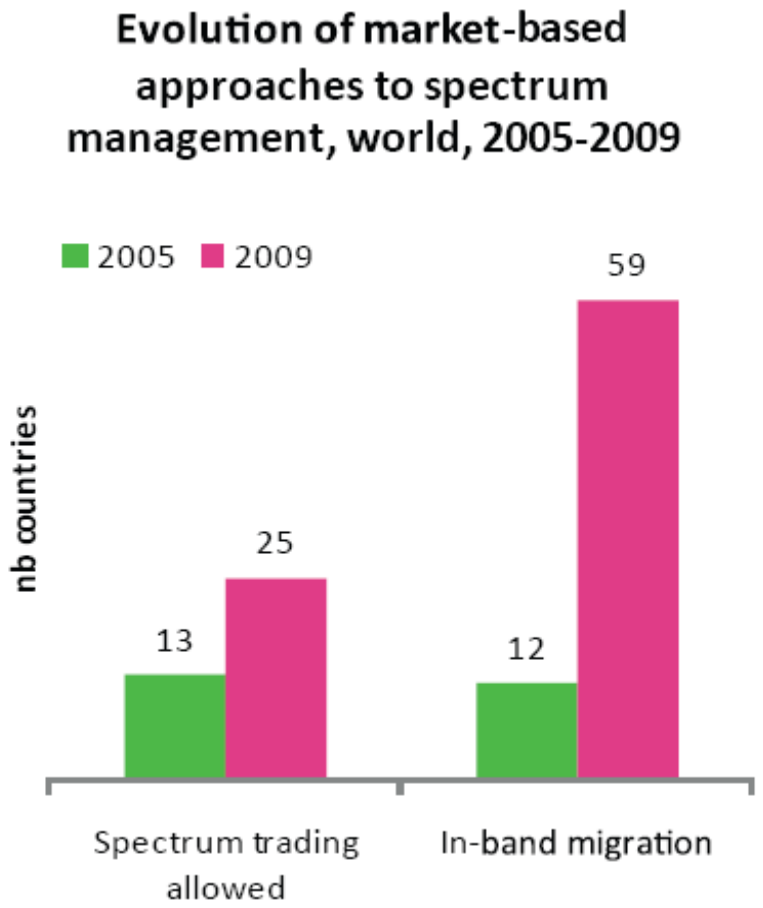
- Industry structures are changing
  - Telephone carriers increasingly interested in video,
  - Governments reacting to convergence by converging regulatory regimes
- Matched at regulatory level: increasing trend towards converged regulators;
  - E.g. Ofcom, ACMA

Who manages spectrum?



Source: ITU World Telecommunication/ICT Regulatory Database.

Institutional Framework Evolution



Source: ITU World Telecommunication/ICT Regulatory Database.

Genuine Market-based Approach

- Use of genuine market mechanisms and forces in the management and licensing of spectrum:
  - Flexibility of use/unified licensing;
  - Spectrum trading and secondary markets:
    - With Property-rights, exclusive right clearly defined;
    - Examples – Australia, Guatemala, and New Zealand and, partially, the U.S.

See: www.ictregulationtoolkit.org Radio Spectrum Management: Section 1.5.2 Market Methods and Section 3.2.1 Methods for Assigning Frequencies

Market-based Approach

- Auctions: switching from administrative reviews followed by an administrative decision to auction does not fundamentally change the spectrum regulatory regime:
  - Licenses specifying the technological apparatus and services to be provided, tie the winner of an auction down as effectively as those firms granted a licence by any other administrative means.
- The key differences for market-based assignment using auctions are that:
  - Auctions assign the licence/spectrum to the firm which bids the most which may in certain conditions be the most efficient firm;
  - Competitive auctions cause any expected excess profits from providing the service to go to the Government, rather than the operator as would be the case if the operator were chosen via a competitive hearing.

See: www.ictregulationtoolkit.org Radio Spectrum Management: Section 1.5.2 Market Methods and Section 3.2.1 Methods for Assigning Frequencies

Regulatory Changes

- Regulation has generally been slow to keep up with convergence
  - There is often separate legislation covering broadcasting
  - Broadcasting is often treated as a special case in regulation
    (reasons include cultural policy; influence of broadcasting)
  - Spectrum for broadcasting is generally kept distinct from that for other services

Deregulation

- Mobile networks
  - Mobile and Internet services are the most competitive markets
  - With continued privatization of many incumbent operators, fixed-line services are also becoming increasingly competitive
  - There is a move towards unified regulation, no longer distinguishing between fixed or mobile networks
    - Particularly when mobile is positioned as a replacement for fixed line service

References for further reading

- Spectrum Policy for the 21st Century – Improving International Spectrum Management Policies and Framework, US Dept. Of Commerce, Pp. 58-66
- http://www.ntia.doc.gov/legacy/osmhome/spectrumreform/International_Spectrum_Policy_Improvements_Report3-13-08_Final.pdf
- Report ITU-R SM.2093. Guidance on the regulatory framework for national spectrum management.

Thank you