

## Radio Spectrum Management

### Overview and Demonstration of the Spectrum Management Online Toolkit

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## Agenda

- ◆ Introduction
- ◆ Module Key Topics
- ◆ Demonstration
- ◆ Discussion



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## Introduction

- ◆ Spectrum Management
- ◆ Administrative Approaches
- ◆ Spectrum Management Reform



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## Spectrum Management

- ◆ Spectrum Management
  - is a combination of administrative & technical procedures to ensure the efficient operation of radiocommunications without causing interference and,
  - ensures interference-free access to as many users & as many uses as possible
  - may provide an economic return to the government.



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## Spectrum Management

- ◆ These activities allocate portions of the radio spectrum to different uses, assign frequencies to different transmitters in a way that minimizes interference, maintain standards to ensure that systems make optimum use of the radio spectrum and implement measures to control unauthorized use.



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## Administrative Approach

- Primarily a technically based system exercised through licensing requirements focused on eliminating or minimizing interference while facilitating access to spectrum by the greatest number of users and uses
- Facing tremendous pressures on the resource due to growth in number of users, number of uses and amount of capacity required per user



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## Spectrum Management Reform

- ◆ Vigorous debate on spectrum management reform is underway in an attempt to overcome persistent shortcomings:
  - Scarcity – due to real congestion, inefficient use, underutilization and artificial scarcity.
  - Administrative adjustment mechanisms – assignment, licensing, re-alignment.
- ◆ Economic costs due to inefficient use are claimed to be enormous (Economist 2004).



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## Spectrum Management Reform

- ◆ Spectrum managers need to address:
  - Current procedural emphasis - should become more policy focused.
  - Regulatory frameworks and organizational functions need to adapt more quickly
  - Traditional administrative approaches can be improved
  - Strengthen organizational and technical capacity



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## Spectrum Management Reform

### Criticisms of the Administrative Approach

- Excessive rigidity – administrative scarcity
- Technology and service innovation may be stifled
- Incentives for efficient use of the resource are not sufficient
- Reinforces barriers to voluntary and involuntary sharing
- Erects barriers to other beneficial transactions



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## Spectrum Management Reform

### ◆ Ideas for Reforming the Traditional System

- Move toward the Use of Market Mechanisms and Forces in the Management and Licensing of Spectrum
  - ◆ Property-rights, exclusive rights
  - ◆ Flexibility of use/unified licensing
  - ◆ Spectrum trading and secondary markets
    - Examples – Australia, Guatemala, and New Zealand and, partially, the U.S.



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## Spectrum Management Reform

- ◆ Ideas for Reforming the Traditional System
  - Unlicensed or Spectrum Commons Approach
    - ◆ No exclusive rights – anyone can use certain blocks of spectrum subject only to certain basic rules (e.g., maximum power) and for any lawful purpose using any technology
      - Examples of commons approach include early examples from radio (e.g., amateur radio service)



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## ICT Regulation Toolkit

- ◆ An online tool to aid Regulators in review of the issues and determination of suitable best practices.
- ◆ <http://www.ictregulationtoolkit.org>
- ◆ **Seven Modules**
  - Regulating the telecommunication sector – overview
  - Competition and Price Regulation
  - Authorization of Telecommunication Services
  - Universal Service
  - **Radio Spectrum Management**
  - Legal and Institutional Framework
  - New Technologies and Impact on Regulation



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## Toolkit Topics

- ◆ Seven Sections in the Module – Each module has further 3-5 subsections
  - Spectrum Management Overview
  - Spectrum Policy and Planning
  - Authorization
  - Spectrum Pricing
  - Spectrum Monitoring and Compliance
  - International Affairs
  - Developing Spectrum Management Capacity



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## Toolkit Demo

- ◆ At GSR two Sections of the online module are demonstrated:
  - 1) Section II - Spectrum Policy and Planning
  - 2) Section IV – Spectrum Pricing
  - Each Section contains subsections which are further broken down into topics.
  - Each Section, subsection and topic have related Practice Notes and Reference Materials which are available for viewing through a hyperlink.



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## Section II – Spectrum Policy and Planning

- ◆ Three Subsections to Section II
  - Planning
  - Technical Standards
  - Allocating Spectrum
- ◆ Over 30 references



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## Section II – Spectrum Policy and Planning

- ◆ Eight Spectrum Planning Topic Areas
  - Planning Timeframes
  - Knowledge of Current Spectrum Use
  - Forecasting Future Spectrum Use
  - National Frequency Allocation Tables
  - National Legislation and Regulations
  - Re-farming Spectrum
  - Financing Spectrum Management
  - Consultation with Stakeholders



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## Section II – Spectrum Policy and Planning

- ◆ Seven Technical Standards Topics
  - Objectives
  - Spectrum Use Standards
  - Equipment Standards
  - Radiation Standards
  - Other Standards
  - Standards Development and Application
  - Certification



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## Section IV – Spectrum Pricing

- ◆ Three Allocating Spectrum Topic Areas:
  - Radio Services
  - Tables of Frequency Allocations
  - Designations of Spectrum Use



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## Section IV – Spectrum Pricing

- ◆ Six Subsections to Section IV
  - Cost Recovery
  - Administrative Incentive Prices
  - Spectrum Royalties
  - Auctions
  - Secondary Markets
  - Lotteries
- ◆ Over 20 references



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## Section IV – Spectrum Pricing

- ◆ Two Cost Recovery Topic Areas:
  - Spectrum Management Agency Cost Structure
  - Setting Prices to Recover Cost
- ◆ Two Administrative Incentive Price Topic Areas:
  - Opportunity Cost of Spectrum
  - Setting Administrative Incentive Prices in Practice



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## Section IV – Spectrum Pricing

- ◆ One Spectrum Royalty Topic Area
- ◆ Four Auction Topic Areas:
  - Types of Auctions
  - Specifying what is to be Auctioned
  - Rules and Procedures for Auctions
  - Auctions in Practice



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## Section IV – Spectrum Pricing

- ◆ Five Secondary Market Topic Areas:
  - Defining Property Rights
  - The Interference Model
  - Combating Market Power
  - Procedures for transfer of Spectrum
  - Secondary Trading in Practice
- ◆ One Lottery Topic Area



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## Demonstration

- ◆ Navigation of Sections II and IV



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## Toolkit Project Team

- ◆ Project awarded to McLean Foster & Co.
- ◆ Project team consists of:
  - Robert W. Jones - Project Director & Spectrum Management Expert
  - Adrian M. Foster - Project Manager & Spectrum Management Consultant
  - Professor Martin Cave - Economics Expert
  - Christian Hyde - Legal Expert
  - Randy McLean - eLearning Content Development Expert
- ◆ Deliverables include:
  - A Concept Paper
  - The Web-based Module
  - Training Materials



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# Discussion and Questions

