

Spectrum Management: Strategic Planning and Policies for Wireless Innovation

Spectrum Policy Analytical framework and review

Place: Algeria

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Session 5 Objectives

The aim of this session is to provide a basis to evaluate the effectiveness of national spectrum policy and strategic planning efforts and to compare and contrast the recent spectrum policies of selected countries.

Module Topics

- Policy Evaluation and Analysis
- Development of a Analytical Framework
- Examples of differences in Spectrum Policy Implementation – Institutional Framework and Market-led vs. Regulatory Intervention
- Spectrum Policy Reform: International Examples

Spectrum Policy

- Spectrum policy refers to a strategic action taken by a ministry or spectrum regulator to promote or increase the effective and efficient use of radio spectrum in order to maximize the benefits of its use to society. The suggested framework is intended to facilitate the analysis of effective and efficient spectrum policies.
- We have already looked at definitions of effective and efficient policy in Session 1.

Spectrum Policy Analysis

- A structured framework for analysis and evaluation of spectrum policy builds on studies of public policy analysis conducted in other fields and incorporates current measures of sector performance typically viewed by policy makers and regulators as leading indicators of improvement. These include:
 - Measures of sector financial health such as broadcast and telecom company revenues and profits, government revenues;
 - Employment, investment and trade;
 - Growth in penetration and usage statistics for a broad range of technologies and services (mobile broadband, satellite broadcast, wireless broadband);
 - Prices of services to consumers and service distributors;
 - Technical efficiency and quality of services for networks and specific services;
 - Spectrum demand and supply and size of spectrum shortfall or degree of spectrum scarcity.

Current Best Practice

- Most often spectrum **policy practices** include:
 - Spectrum policy reviews where policies are compared with spectrum policies that have typically been in force for sometime by leading regulators. The comparison may be done to examine similarities, various options, and expected and actual outcomes;
 - Existing policies are reviewed and examined through analysis most often incorporating consultations with determine weaknesses and areas for improvement.
- Ideally the review, analysis and evaluation is evidenced based and includes a thorough and comprehensive examination of issues.
 - Issues related to the implementation of the policy are identified so that the chances of future success can be assessed and implementation properly planned.

Suggested Analysis Approach

Effects	Effectiveness	What effects does the policy have on the target spectrum management goal?
	Unintended effects	What are the unintended effects of this policy?
	Equity	What are the effects of the policy on different groups?
Implementation	Efficiency and cost	What are the financial costs of the policy and do benefits outweigh costs?
	Feasibility	Is the policy technically feasible and within the capabilities of the various actors?
	Acceptability	Do the relevant stakeholders view the policy as acceptable?

Analytical Dimensions - Effectiveness

- **Effectiveness**

- What are the effects of the spectrum policy being considered (positive, neutral, negative) on the targeted problem(s) (market, accessibility, technical)?
- How effective is this policy in terms of its intermediate effects?
- Is the intervention by the government/regulator for the spectrum policy true and justifiable?
- How does the implementation context influence this policy's effectiveness?
- How much time is needed before effects can be observed?
- Do the positive or potentially negative effects persist over time, i.e. Are the positive effects durable.

Analytical Dimensions - Unintended Effects and Equity

- **Unintended effects**

- Does the spectrum policy being considered produce significant unintended effects, whether positive or negative?
- Are there ways to mitigate the negative unintended effects?

- **Equity**

- What are the effects (intended or unintended) of the spectrum policy being considered different groups? Are the effects evenly distributed or does one group receive substantially all of the benefits or experience most of the loss in benefits?
- Does this spectrum policy create, reinforce or correct social inequalities in terms of access to telecommunications, other important services such as Public Protection and Disaster Recovery?

Analytical Dimensions - Efficiency and Cost

- **Efficiency and Cost**

- What are the financial benefits and cost for the government, the NRA and other stakeholders such industry, community organizations, consumers, taxpayers, etc.)?
- Are the efficiency gains and costs predictable and measurable and distributed over time?
- How do the costs of the spectrum policy being considered compare with other policy options, including doing nothing?
- Finally, what is the overall cost-effectiveness of the spectrum policy being considered for the government and for society?

Analytical Dimensions - Feasibility

- **Feasibility**

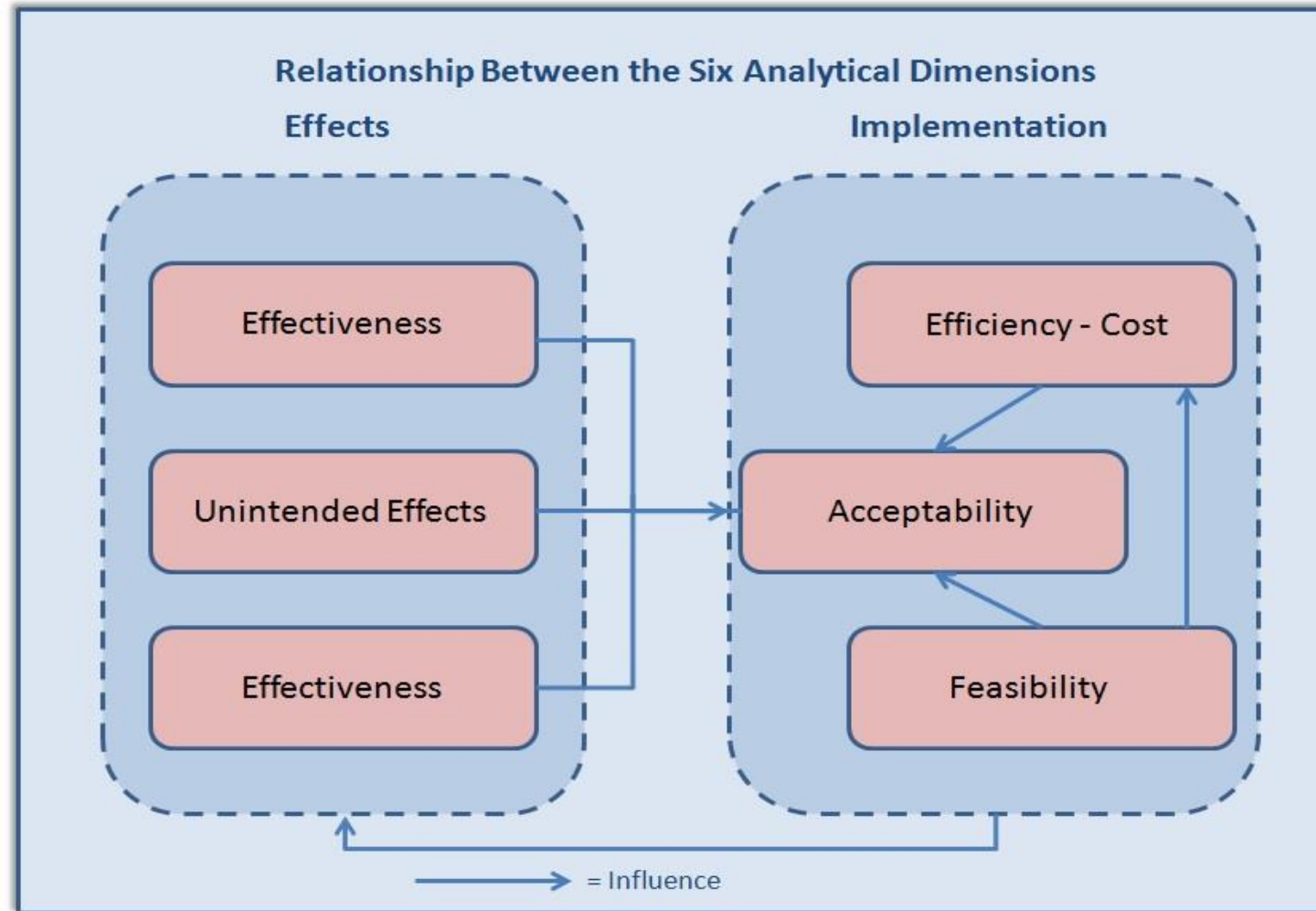
- Are the necessary human, material, and technological resources available for implementation by the affected players?
- Does the spectrum policy fall within the legal jurisdiction of the NRA who wishes to adopt it? Is it in conformity with existing legislation?
- Is this spectrum policy subject to pilot program testing i.e. Small scale prior to full implementation?
- Can this spectrum policy be administered by existing mechanisms or are new systems and processes necessary?
- Is the authority promoting this policy also the one that will implement it? If not, how many different actors are involved in implementing this policy? Are they effectively guided by the policy's promoters? Do they cooperate well?
- Do the opponents of this spectrum policy have the ability to interfere with its adoption, its implementation?

Analytical Dimensions - Acceptability

- **Acceptability**

- Is the problem targeted by this spectrum policy considered a significant issue that is recognized as requiring intervention?
- Which stakeholders are or would be affected by the spectrum policy being considered?
- What are and will be the stakeholders' reactions to the idea of legal or regulatory intervention to address this problem?
- Do the stakeholders agree on how they think the issue should be addressed?
- What do stakeholders think of the proposed spectrum policy? Of its effectiveness, its unintended effects, its equitability, its cost, and its feasibility? Of the degree of coercion or dissatisfaction it involves?
- What do stakeholders think of the conditions surrounding adoption and implementation of this policy?
- Can the likelihood spectrum policy's acceptability evolve and improve during the period in which it is being implemented?

Relationship Between the Six Analytical Dimensions



Examples of Differences in Spectrum Policy Implementation

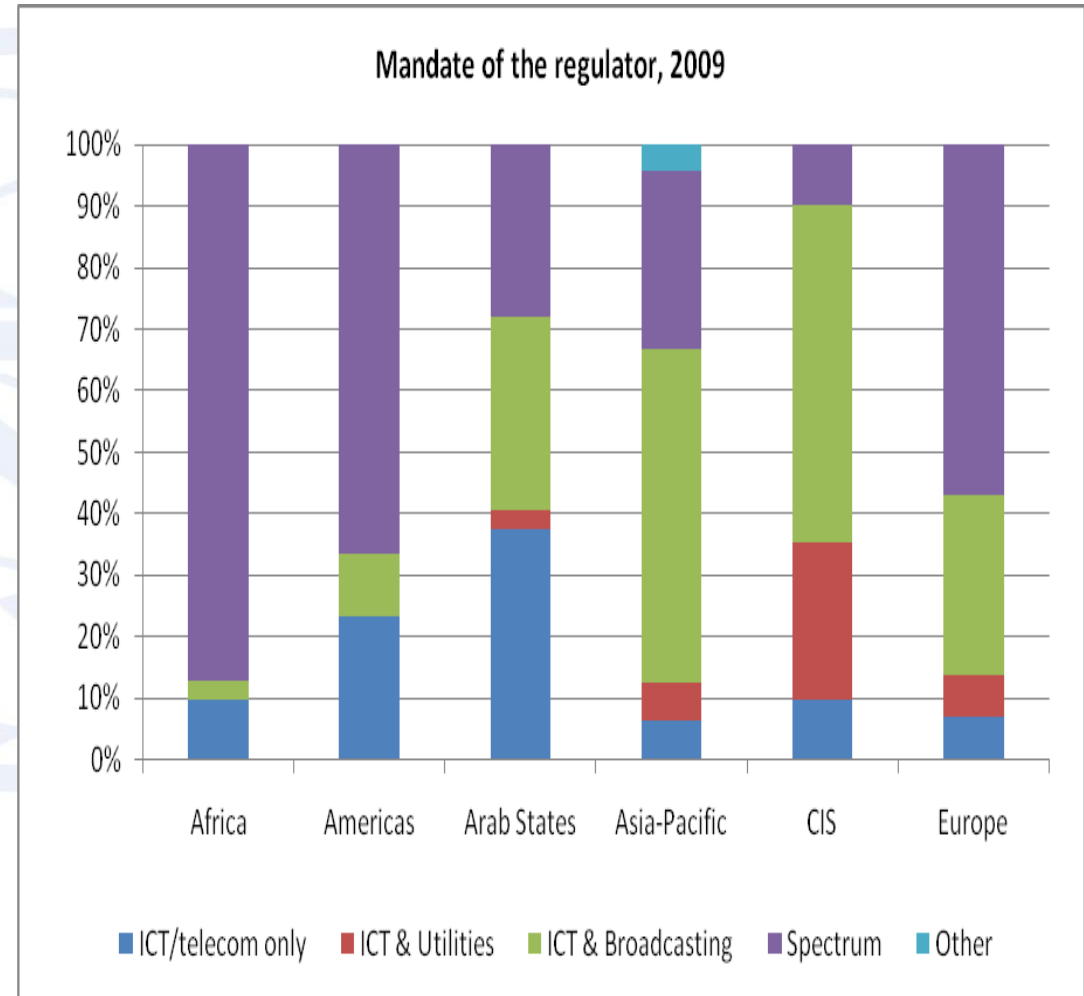
- Three broad examples of differences in spectrum policy implementation are given (Institutional Model, Market-led vs. Intervention and spectrum management reform) at this point although the range of examples where differences exist in spectrum policy implementation by regulators is immense:
 - spectrum licensing and assignment policies such as the use of auctions or other methods and flexible licences;
 - Spectrum pricing policies such as use of cost recovery or market based spectrum prices.

Institutional Models

- The Regulator – responsible for the licensing of services to operators for either broadcast or telecommunications
- National Regulatory Authority – the spectrum management authority. Responsible for planning, engineering authorization, and spectrum monitoring.

Institutional Models Differ

- Circumstances are different in the three ITU regions .
- Region 1 has multiple sovereign markets and attempts a unified approach;
- Region 2 developments have been dominated by the US and often reflects a single market approach whereas in across
- Region 3 encompassing Asia, Pacific, Australia and Oceania, there multiple sovereign markets and no dominant unified approach.



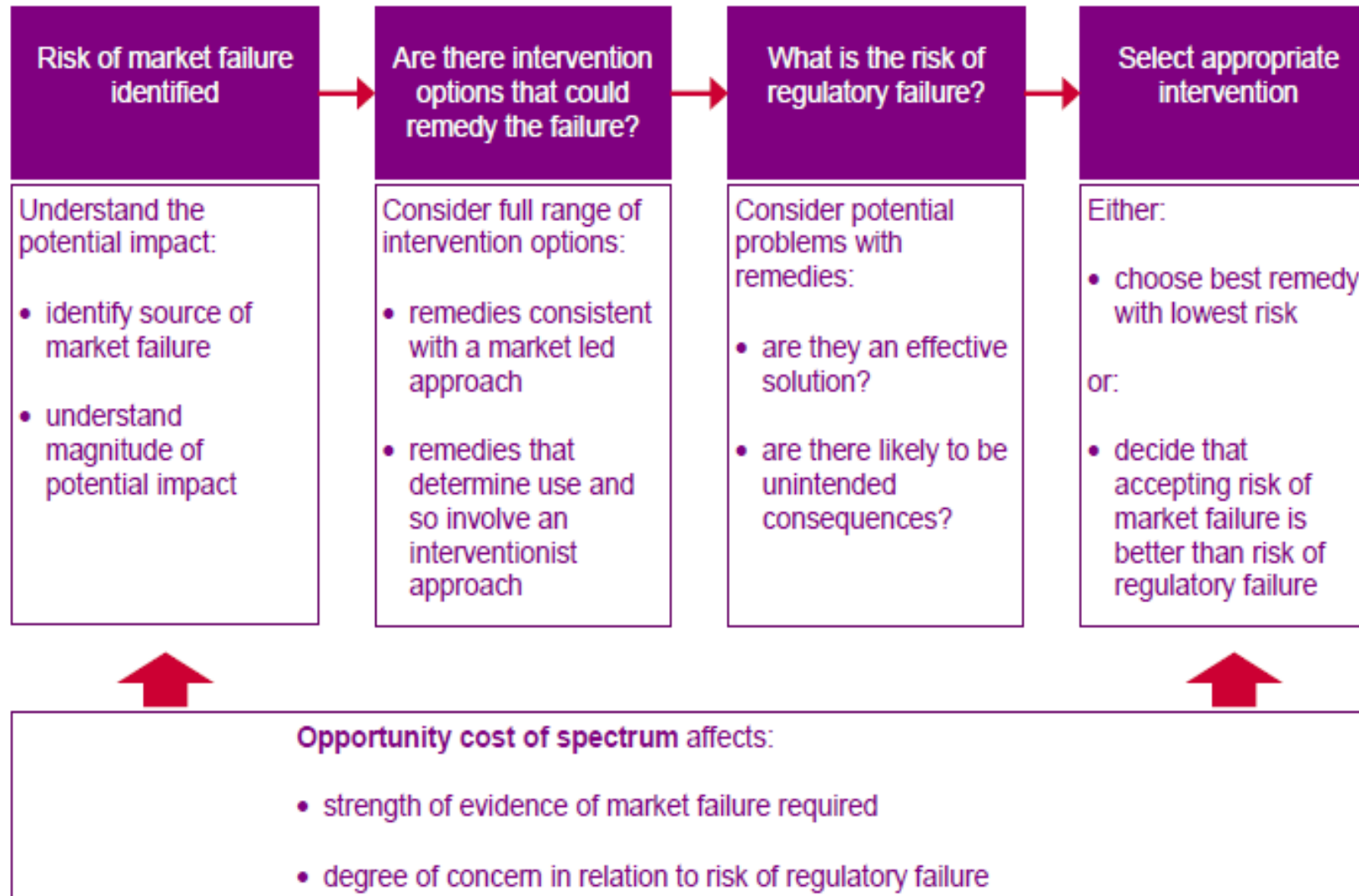
Examples of Institutional Models

- Combined single multi-media regulator and NRA – Australia, Czech Republic, Singapore, UK
- Multi-Sector Regulator – Germany, Rwanda
- Separate Regulators for broadcast and telecom and single NRA - Canada, Kenya
- Separate Regulator and several NRA's – Georgia, Moldova
- Several Regulators and Single NRA – Poland
- No separate regulator and NRA – ministry responsible – Japan
- No separate regulator– ministry responsible – there is an NRA - Tunisia
- Regulator for commercial Spectrum and an NRA for Government Use Spectrum - USA

Market Led vs. Regulatory Intervention

- For many spectrum allocation, assignment and licensing situations NRA's can chose between market-led approaches (service and technology neutral) and regulatory interventionist approaches to managing radio spectrum.
- Even in highly liberalized markets that allow for more flexibility through service and technology neutral licensing, spectrum policy makers and regulators usually consider social, cultural and developmental objectives.
- Simply put there are trade-offs between considerations such as economic value and benefits and society's social welfare due to access to broad forms of media and content.

Trade Off between Market Led and Interventionist Approaches



The United States - Spectrum Liberalization

- The United States has been a leader in spectrum liberalization, particularly with regard to non-government spectrum. Government spectrum continues to be managed in a more traditional manner.
- The 2003 Presidential Spectrum Policy Initiative proposed to give the FCC permanent authority to assign Authorizations via auction. It also urged policy makers to explore possible incentives, including expanded user fees, to induce more efficient spectrum usage.
- The United States has also moved progressively in the direction of flexible use of spectrum, in conjunction with generally liberalized practices. The Communications Act of 1934, as amended, specifically authorizes the FCC to permit flexible use where:
 - It is consistent with international agreements to which the United States is a party;
 - The Commission finds, after notice and an opportunity for public comment, that such an allocation would be in the public interest;
 - Such use would not deter investment in communications services and systems, or technology development; and
 - Such use would not result in harmful interference among users.

US - Spectrum Liberalization

- The FCC's Spectrum Policy Task Force in 2002 advocated:
 - Increased reliance on both the exclusive use and the commons models, and reduced use of traditional allocation mechanisms;
 - Maximum feasible flexibility for licensees, limited only by interference concerns;
 - Increased use of spectrum trading, including the ability to lease spectrum on an overlay or underlay basis.

UK– Flexible User Rights and Spectrum Trading

- OFCOM has shifted UK spectrum policy towards a more flexible system of spectrum management. It has liberalized spectrum usage rights and spectrum trading. A gradual approach is being adopted, embracing progressively more bands and greater flexibility but relying on competitive assignment methods.
- The UK has also adopted a policy of extending market methods of spectrum management to public sector spectrum, giving public sector users the right to trade or lease their spectrum and the obligation to go into the market place to acquire additional spectrum.

UK – Flexible User Rights and Spectrum Trading

- OFCOM has also extended the application of administrative incentive pricing (AIP) to government agencies, requiring them to pay commercial prices for their existing spectrum, as set by regulators.
 - Administrative Incentive Prices: intended to encourage licensees of non-auctioned spectrum to use their spectrum rights efficiently; legislation enables annual licence fees to be set above administrative cost to reflect a range of spectrum management objectives (efficient management and use, economic and other benefits, innovation and competition), having regard in particular to availability and present and expected future demand for spectrum. OFCOM has been using AIP since 1998 and revised the approach in 2004.

Spectrum Management Review - India

- In October 2009, the Telecommunication Regulatory Authority of India published a consultation paper examining a broad range of spectrum management activities and issues with central focus on:
 - Spectrum Requirements
 - Spectrum Licensing, and
 - Spectrum Assignments
- The consultation process completed in early 2010 and the TRAI has published a paper with recommendations on a range of issues on May 16, 2010.
- ***Spectrum Requirements*** The issues considered include:
 - How much government spectrum should be refarmed and what are the suggested best methods for re-farming spectrum;
 - What will be the impact of the Digital Dividend

Spectrum Management Review - India

- ***Spectrum Licensing*** The issues considered include:
 - Should spectrum trading be permitted and when;
 - Should spectrum caps be used and what are appropriate spectrum block sizes;
 - Appropriate conditions for spectrum sharing; and
 - Types of spectrum authorizations.
- ***Spectrum Assignment and Pricing*** The issues considered include:
 - De-linking spectrum licenses from telecommunication licenses;
 - When to use market-based mechanisms;
 - How should non-commercial spectrum be assigned;
 - Should annual spectrum charges be used and how often should they be revised;
 - How should the spectrum management organization be restructured to better reflect spectrum management recoverable costs?

Summary

- The reasons for spectrum policy development and the approach taken by governments and NRA's for implementation will differ because of different economic and social conditions and factors. This is clearly evident in many situations around the globe.
- Some tools, considerations and suggestions for spectrum policy analysis have been presented which can be used in the evaluation of effective policy and in planning for successful implementation of policy.

References for further reading:

- Report ITU-R SM.2015 Spectrum Planning - Methods For Determining National Long-Term Strategies For Spectrum Utilization
- 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](http://www.ntia.doc.gov/legacy/osmhome/spectrumreform/International%20Spectrum%20Policy%20Improvements%20Report3-13-08%20Final.pdf) Reference 2



Thank you