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| **Radiocommunication Bureau** |  |
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| Source: Documents 1/61 (Attachment: ”Report on Resolution 9”), [1/82(Rev.1)](https://www.itu.int/md/R15-SG01-C-0082/en)  Subject: WTDC-14 Resolution 9 (Rev. Dubai, 2014) | **27 June 2017** |
| **English only** |
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| areas of the report on WTDC Resolution 9 (Rev. Dubai, 2014), where significant modifications have been made | |
| WTDC-14 Resolution 9: Participation of countries, particularly developing countries, in spectrum management | |

In response to the request made during the ITU-R Study Group (SG) 1 meeting on 21 June 2017, this document provides information to facilitate the understanding of the modifications made to the original report provided by ITU-D SG1 on Resolution 9 (Rev. Dubai, 2014), as attached to ITU-R SG 1 Document [1/61](https://www.itu.int/md/R15-SG01-C-0061/en).

There are also four Chapters as the Report provided by ITU-D SG1 with amendments described generally as follows:

– Chapter 1, initially focusing on “Emerging spectrum management approaches” was renamed “Spectrum management approaches” in order to deliver a broader view of solutions to meet the demand for connectivity, instead of focusing primarily on one approach (DSA) and one technology (TVWS), as requested by *Resolves 1* of Resolution 9 (Rev. Dubai, 2014).

A new section provides a focus on ITU regulatory framework for wireless broadband: IMT , RLANs , HAPS and satellite systems (ESIM part was from previous Chapter 3).

The considerations on TV White Spaces (TVWS) were grouped under chapter 1 as one spectrum management approach that falls under the principle of dynamic spectrum sharing. The related summary of these case studies was moved into an annex. Some of the claimed advantages of the TVWS approach initially presented under chapter 2 were moved into chapter 1 under a new section on Benefits and Challenges associated with the use of TV White Spaces.

– Chapter 2 which examines various economic aspects of spectrum management . Experiences of different administrations were moved to an annex.

– Chapter 3 on spectrum management activities was shortened as a result of the move of information (spectrum refarming, TVWS, ESIM) into chapter 1. Related examples/experiences were also moved into new annex 2 in order to achieve a consistent and balanced approach on case studies.

– Chapter 4 on spectrum monitoring was in comparison not significantly amended.

The table below indicates where to locate, in the revision to the Report on WTDC Resolution 9 (Rev. Dubai, 2014), as contained in ITU-R Study Group (SG) 1 Document [1/82 (Rev.1)](https://www.itu.int/md/R15-SG01-C-0082/en), the elements contained in the sections of the original report.

This also indicates the areas where significant modifications have been made to the original report and the scope of these modifications.

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| **Table of contents of the original Report**  (Document 1/61, Attachment: ”Report on Resolution 9”) | **Corresponding Sections/Annexes of the revised Report**  (Doc. 1/82(Rev.1) **and scope of the modifications** | |
| i. Executive Summary | i. Executive Summary  Re-drafted to take into account the revisions made to the Report | |
| **1 CHAPTER 1 – Emerging spectrum management approaches** | **1 CHAPTER 1 – Spectrum management approaches** Chapter 1 was renamed in order to deliver a broader view of the spectrum management approaches | |
| 1.1 **Introduction** | Re-drafted to take into account the revisions made in Chapter 1 of the Report. | |
| 1.2 **Dynamic Spectrum Access (DSA)** | This section has been renamed “**ITU regulatory framework for wireless broadband**” to provide a more general overview of all options available for developing countries to manage spectrum for providing wireless broadband, including “**IMT**” (Section 1.2.1), “**WAS/RLANs**” (Section 1.2.2), “**HAPS**” (Section 1.2.3) and “**Satellite systems**” (Section 1.2.4, including HDFSS systems (Section 1.2.4.1), ESIMs (Section 1.2.4.2) and Non-GSO systems (Section 1.2.4.3)).  The original text in this section has been merged into the relevant parts of new Section 1.4. **Spectrum sharing**, which provides a more complete presentation of the trends in spectrum sharing and in which the ambiguous abbreviation “DSA”, meaning both Dynamic Spectrum Alliance (a specific industry group) and Dynamic Spectrum Access, is replaced by the unambiguous term of “dynamic spectrum sharing”. | |
| 1.2.1 **ITU regulatory framework for DSA** | Merged into the more comprehensive Section 1.4.3 **ITU regulatory framework for spectrum sharing** | |
| 1.2.2 **Tiered access to spectrum using DSA** | Split into Sections 1.4.4 **Licensed Shared Access (LSA)**, and 1.4.5 **Tiered access to spectrum** to clearly separate the various concepts. | |
| 1.2.3 **DSA as applied to the TV White Space spectrum** | The considerations on TV White Spaces (TVWS) were restructured into Section 1.4.6 **TV White Spaces**, 1.4.7 **Case studies of broadband access in the TVWS** and the 1.4.8 **Benefits and challenges associated with the use of TV white spaces** | |
| 1.3 **Regulatory considerations for TV White Spaces** | To clarify and structure the regulatory concepts, e.g. licensed / license-exempt, and various types of spectrum sharing:   * A new Section 1.3 describes the “**Spectrum management under the licensed approach**” with the “**Spectrum management for mobile broadband**” (Section 1.3.1), the “**Transition to digital terrestrial television broadcasting**” (Section 1.3.2), the “**Strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services**” (Section 1.3.3) and the “**Recent trends**” (Section 1.3.4);  - A new Section 1.4 describes all the aspects of the “**Spectrum Sharing**” in a factual and balanced way with “**Spectrum sharing under the license-exempt approach**” (Section 1.4.1), “**Dynamic spectrum sharing**” (Section 1.4.2), “**ITU regulatory framework for spectrum sharing**” (Section 1.4.3), “**Licensed Shared Access (LSA)**” (Section 1.4.4), the “**Tiered access to spectrum**” (Section 1.4.5), “**TV White Spaces**” (Section 1.4.6), “**Case studies of broadband access in the TVWS**” (Section 1.4.7) and “**Benefits and challenges associated with the use of TV white spaces**” (Section 1.4.8). * The original text under Section 1.3 has been merged into Sections 1.4.2 **Dynamic spectrum sharing** and 1.4.6 **TV White Spaces** | |
| 1.3.1 **Interference protection experiences** | See Sub-sections 1.4.6.1 for the general description and Annex 2 Section A2-2 for the technical details. | |
| 1.3.2 **Interference avoidance methods** |
| 1.3.3 **Device parameters** | These two sections included very technical and detailed information, which is more suited for an ITU-R Recommendation than for a Report on spectrum management approaches and trends. Consequently, this information has not been retained. | |
| 1.3.4 **Database parameters** |
| 1.3.5 **Summary of regulatory approaches for TVWS** | Merged into new section 1.4.8 **Benefits and challenges associated with the use of TV white spaces**, which also includes the elements which did not relate to the economic aspects in original Sections 2.4.1 **Potential benefits to consumers associated with shared use of TV white spaces** and 2.4.2 **Potential regulatory costs associated with shared use of TV white spaces** | |
| 1.4 **Case studies of broadband access in the TVWS using DSA** | These case studies are summarized in Section 1.4.7 **Case studies of broadband access in the TVWS** and the original text was moved, without changes, to Section A2-3 of Annex 2.  In addition, new text was provided by Ghana and included in both places. | |
| 1.4.1 **Bhutan** |
| 1.4.2 **Botswana** |
| 1.4.3 **Republic of Korea** |
| 1.4.4 **Malawi** |
| 1.4.5 **The Philippines** |
| 1.4.6 **United States of America** |
| 1.4.7 **Additional trials** |
| 1.4.8 **Summary insights from case studies** |
| 1.5 **Current ITU-R studies and investigations** | This section was significantly reduced and move to the part “**References**” before the Annexes, which includes all the relevant ITU-R references. | |
| **2 CHAPTER 2 – Spectrum economics** |  | |
| 2.1 **Introduction** | Introduction was re-drafted to take into account the revisions made in the rest of Chapter 2 and to encourage the reading of Report ITU-R SM.2012-5 without a repetition of this Report. Section 2.2 was incorporated into the introduction. | |
| 2.2 **Report ITU-R SM.2012-5** (6/16) – “Economic aspects of spectrum management” |
| 2.3 **Experience of Administrations with respect to spectrum pricing, licensing fees, and auctions** | Section renamed and renumber 2.2 **Spectrum pricing, licensing fees and auctions**  Experiences of different administrations were summarized and the current text moved to Annex 2 Section A2-4. | |
| 2.3.1 **Côte d’Ivoire – Estimating costs of licenses and frequencies** |
| 2.3.2 **Republic of Niger – Method to determine the frequency fees** |
| 2.3.3 **Russian Federation – Experience of Russian Federation in the field of spectrum fees** |
| 2.3.4 **Republic of Korea –Beauty contest and auction in spectrum management** |
| 2.4 **Economic aspects related to licensed exempt use of the TVWS** | Section 2.4 was restructured into:  2.3 **Economic aspects related to improving broadband access**  2.4 **Assessing the economic benefits of using spectrum**  These sections were clarified to clearly separate the concepts involved: economic benefits of improving broadband access (Section 2.3), of using spectrum under the licensed (Section 2.4.1) and licensed-exempt (Section 2.4.2) approaches, potential costs and economic benefits associated with the share use of spectrum (Section 2.4.3).  The information not related to economic considerations in original Sections 2.4.1 **Potential benefits to consumers associated with shared use of TV white spaces** and 2.4.2 **Potential regulatory costs associated with shared use of TV white spaces** was moved to Section 1.4.8 **Benefits and challenges associated with the use of TV white spaces** in order to more accurately reflect instructs 1 of Resolution 9 (Rev. Dubai, 2014). | |
| 2.4.1 **Potential benefits to consumers associated with shared use of TV white spaces** |
| 2.4.2 **Potential regulatory costs associated with shared use of TV white spaces** |
| **3 CHAPTER 3 – Spectrum management activities and resources** | | Chapter 3 was shortened as a result of the move of information (spectrum refarming, ESIM) into Chapter 1 |
| 3.1 **NTFA guidelines** | | Basically unchanged with the following exceptions:  - national experiences were summarized and the current text moved to Annex 2 Sections A2-5 and A2-6  - the considerations under Section 3.2.3 **Strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services** were moved to Section 1.3.2 and 1.3.3 |
| 3.1.1 **National Table of Frequency Allocations (NTFA)** | |
| 3.1.2 Assessing countries’ needs for spectrum management and IT tools/systems | |
| 3.1.3 **Hungary – Spectrum Management IT System (STIR)** | |
| 3.2 **Spectrum re-allocation (including digital dividend)** | |
| 3.2.1 **People’s Republic of China – The improvement of spectral efficiency based on LTE technology** | |
| 3.2.2 **Tanzania − The legal framework on Spectrum Management in Tanzania** | |
| 3.2.3 **Strategies and methods of migration from analogue to digital terrestrial broadcasting and implementation of new services** | |
| 3.3 **Spectrum management approach for the consideration of earth stations in the fixed-satellite service, including Earth Stations In Motion (ESIMs)** | | Section moved to Section 1.2.4.2. |
| 3.3.1 **CEPT adopts regional regulatory approach** | |
| 3.3.2 **WRC-15 on ESIMs** | |
| 3.3.3 **ESIM authorizations outside CEPT** | |
| 3.3.4 **Consideration for spectrum managers in developing countries** | |
| 3.4 **Results and preparations of World Radiocommunication Conferences** | | Now Section 3.2, with improvement and update of the texts. |
| 3.4.1 **WRC cycle and WRC process** | |
| 3.4.2 **WRC-15** | |
| 3.4.3 Preparation for WRC-19 and WRC-23 | |
| **4 CHAPTER 4 – Spectrum monitoring** | | Not significantly amended. |
| 4.1 **Identification of methodologies on setting up a spectrum monitoring network** | |
| 4.1.1 **Setting up tenders** | |
| 4.1.2 **Planning a spectrum monitoring network** | |
| 4.2 **Challenges of detecting weak signals and solutions** | |
| 4.3 **Summary** | |
| **Glossary** | | Updated according to the terms and abbreviations used. |
| **Abbreviations and acronyms** | |
| **References** | | Split into a Section “**References**” to include all the relevant ITU-R references, and the former Section now “**Other References**” which will need to be updated administratively before the publication of the revised Report. |
| **Annex 1: Spectrum access schemes** | | This Annex was deleted since it provided information of a rather theoretical natural on spectrum access schemes, of which several are rather unproven. Also, the terminologies used in this annex are not commonly used by administrations and no practical guidance was offered to administrations in the context of the report on Resolution 9. |
| **Annex 2: Existing regulations on TV white space** | | Now **Annex 1**, no other changes, excepting updating references. |
|  | | **New Annex 2: Case studies and countries experiences**  New Annex, including the case studies and countries experienced moved from Chapters 1 and 2. This Annex also includes a Section A2-1 “**Digital Dividend**” to provide relevant information on the auctions relating to the use of the Digital Dividend by the mobile service. |
| **Annex 3: Case studies and contribution received for WTDC Resolution 9** | | **Annex 3: Contribution received for WTDC Resolution 9**  No change apart from the title to better reflect the content of this annex. |

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