ITU ACTIVITY FOR SPACE SCIENCE SERVICES

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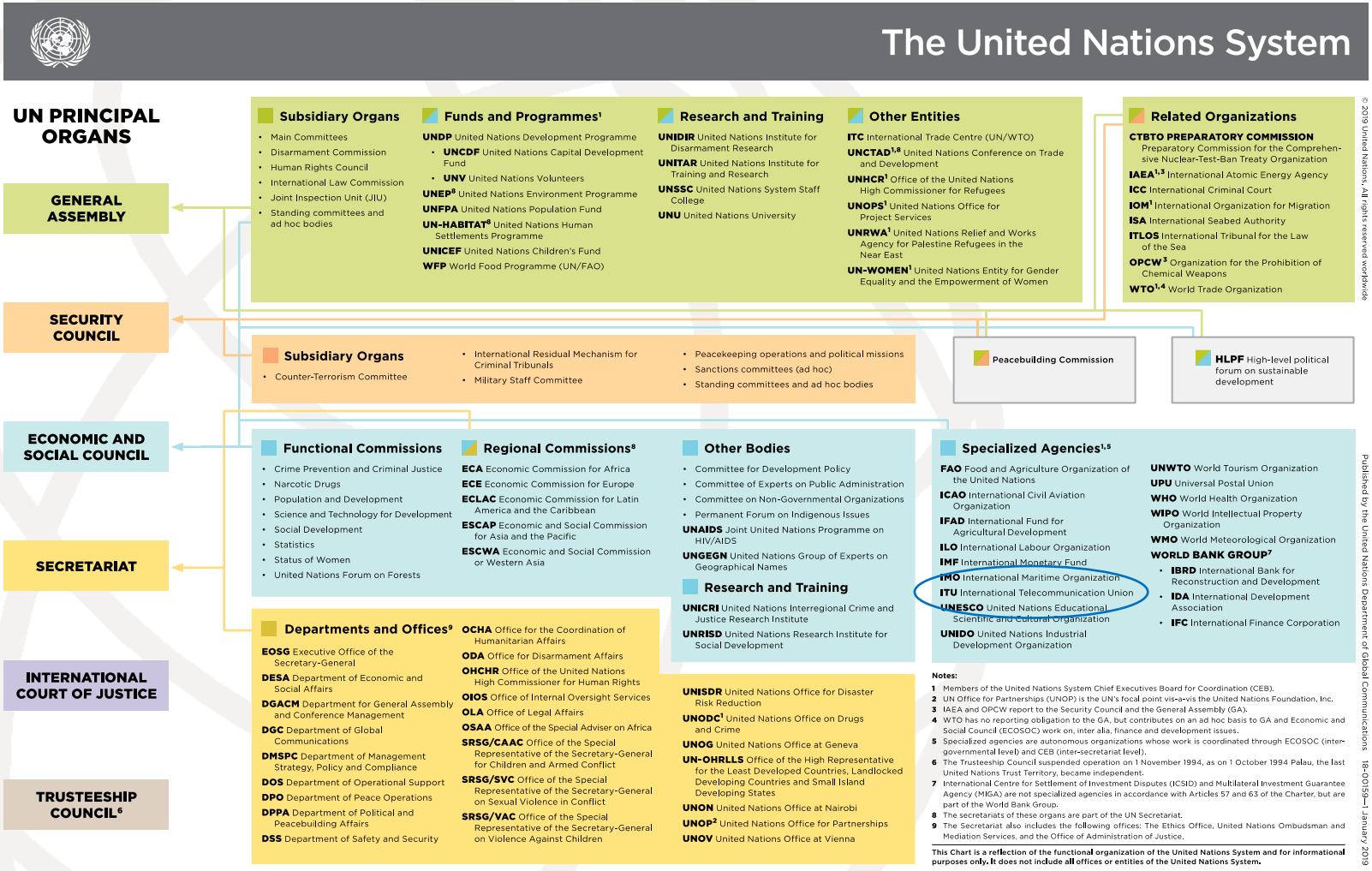
International Telecommunication Union

Committed to connecting the world

ITU


The United Nations System
UN PRINCIPAL ORGANS
GENERAL ASSEMBLY
SECURITY COUNCIL
ECONOMIC AND SOCIAL COUNCIL
SECRETARIAT
INTERNATIONAL COURT OF JUSTICE
TRUSTEESHIP COUNCIL[6]
Subsidiary Organs
Main Committees
Disarmament Commission
Human Rights Council
International Law Commission
Joint Inspection Unit (JIU)
Standing committees and ad hoc bodies
Funds and Programmes[1]
UNDP United Nations Development Programme
UNCDF United Nations Capital Development Fund
UNV United Nations Volunteers
UNEP[8] United Nations Environment Programme
UNFPA United Nations Population Fund
UN-HABITAT[8] United Nations Human Settlements Programme
UNICEF United Nations Children's Fund
WFP World Food Programme (UN/FAO)
Research and Training
UNIDIR United Nations Institute for Disarmament Research
UNITAR United Nations Institute for Training and Research
UNSSC United Nations System Staff College
UNU United Nations University
Other Entities
ITC International Trade Centre (UN/WTO)
UNCTAD[1,8] United Nations Conference on Trade and Development
UNHCR[1] Office of the United Nations High Commissioner for Refugees
UNOPS[1] United Nations Office for Project Services
UNRWA[1] United Nations Relief and Works Agency for Palestine Refugees in the Near East
UN-WOMEN[1] United Nations Entity for Gender Equality and the Empowerment of Women
Related Organizations
CTBTO PREPARATORY COMMISSION Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization
IAEA[1,3] International Atomic Energy Agency
ICC International Criminal Court
IOM[1] International Organization for Migration
ISA International Seabed Authority
ITLOS International Tribunal for the Law of the Sea
OPCW[3] Organization for the Prohibition of Chemical Weapons
WTO[1,4] World Trade Organization
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Subsidiary Organs
Counter-Terrorism Committee
International Residual Mechanism for Criminal Tribunals
Military Staff Committee
Peacekeeping operations and political missions
Sanctions committees (ad hoc)
Standing committees and ad hoc bodies
Peacebuilding Commission
HLPF High-level political forum on sustainable development
Functional Commissions
Crime Prevention and Criminal Justice
Narcotic Drugs
Population and Development
Science and Technology for Development
Social Development
Statistics
Status of Women
United Nations Forum on Forests
Regional Commissions[8]
ECA Economic Commission for Africa
ECE Economic Commission for Europe
ECLAC Economic Commission for Latin America and the Caribbean
ESCAP Economic and Social Commission for Asia and the Pacific
ESCWA Economic and Social Commission for Western Asia
Other Bodies
Committee for Development Policy
Committee of Experts on Public Administration
Committee on Non-Governmental Organizations
Permanent Forum on Indigenous Issues
UNAIDS Joint United Nations Programme on HIV/AIDS
UNGEGN United Nations Group of Experts on Geographical Names
Research and Training
UNICRI United Nations Interregional Crime and Justice Research Institute
UNRISD United Nations Research Institute for Social Development
Specialized Agencies[1,5]
FAO Food and Agriculture Organization of the United Nations
ICAO International Civil Aviation Organization
IFAD International Fund for Agricultural Development
ILO International Labour Organization
IMF International Monetary Fund
IMO International Maritime Organization
ITU International Telecommunication Union
UNESCO United Nations Educational, Scientific and Cultural Organization
UNIDO United Nations Industrial Development Organization
UNWTO World Tourism Organization
UPU Universal Postal Union
WHO World Health Organization
WIPO World Intellectual Property Organization
WMO World Meteorological Organization
WORLD BANK GROUP[7]
IBRD International Bank for Reconstruction and Development
IDA International Development Association
IFC International Finance Corporation
Departments and Offices[9]
EOSG Executive Office of the Secretary-General
DESA Department of Economic and Social Affairs
DGACM Department for General Assembly and Conference Management
DGC Department of Global Communications
DMSPC Department of Management Strategy, Policy and Compliance
DOS Department of Operational Support
DPO Department of Peace Operations
DPPA Department of Political and Peacebuilding Affairs
DSS Department of Safety and Security
OCHA Office for the Coordination of Humanitarian Affairs
ODA Office for Disarmament Affairs
OHCHR Office of the United Nations High Commissioner for Human Rights
OIOS Office of Internal Oversight Services
OLA Office of Legal Affairs
OSAA Office of the Special Adviser on Africa
SRSG/CAAC Office of the Special Representative of the Secretary-General for Children and Armed Conflict
SRSG/SVC Office of the Special Representative of the Secretary-General on Sexual Violence in Conflict
SRSG/VAC Office of the Special Representative of the Secretary-General on Violence Against Children
UNISDR United Nations Office for Disaster Risk Reduction
UNODC[1] United Nations Office on Drugs and Crime
UNOG United Nations Office at Geneva
UN-OHRLLS Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
UNON United Nations Office at Nairobi
UNOP[2] United Nations Office for Partnerships
UNOV United Nations Office at Vienna
Notes:
1 Members of the United Nations System Chief Executives Board for Coordination (CEB).
2 UN Office for Partnerships (UNOP) is the UN's focal point vis-a-vis the United Nations Foundation, Inc.
3 IAEA and OPCW report to the Security Council and the General Assembly (GA).
4 WTO has no reporting obligation to the GA, but contributes on an ad hoc basis to GA and Economic and Social Council (ECOSOC) work on, inter alia, finance and development issues.
5 Specialized agencies are autonomous organizations whose work is coordinated through ECOSOC (intergovernmental level) and CEB (inter-secretariat level).
6 The Trusteeship Council suspended operation on 1 November 1994, as on 1 October 1994 Palau, the last United Nations Trust Territory, became independent.
7 International Centre for Settlement of Investment Disputes (ICSID) and Multilateral Investment Guarantee Agency (MIGA) are not specialized agencies in accordance with Articles 57 and 63 of the Charter, but are part of the World Bank Group.
8 The secretariats of these organs are part of the UN Secretariat.
9 The Secretariat also includes the following offices: The Ethics Office, United Nations Ombudsman and Mediation Services, and the Office of Administration of Justice.
This Chart is a reflection of the functional organization of the United Nations System and for informational purposes only. It does not include all offices or entities of the United Nations System.
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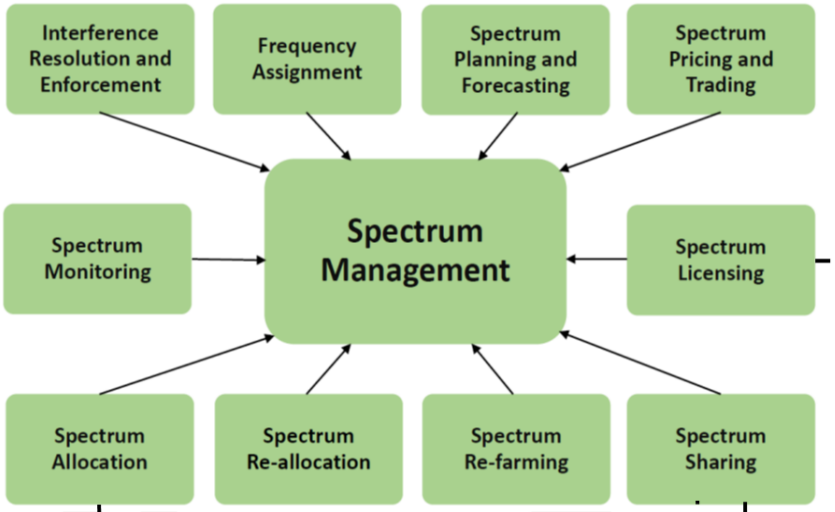
ITU Constitution

- ITU shall effect allocation of bands of the spectrum…in order to avoid harmful interference between radio stations of different countries;
- ITU shall coordinate efforts to eliminate harmful interference between radio stations of different countries
- ITU-R ensures the rational, equitable, efficient and economical use of the radio-frequency spectrum/orbits by all radiocommunication services
- All stations must be established and operated in such a manner as not to cause harmful interference to the radio services of other Member States which operate in accordance with the provisions of the Radio Regulations

Spectrum Management Process



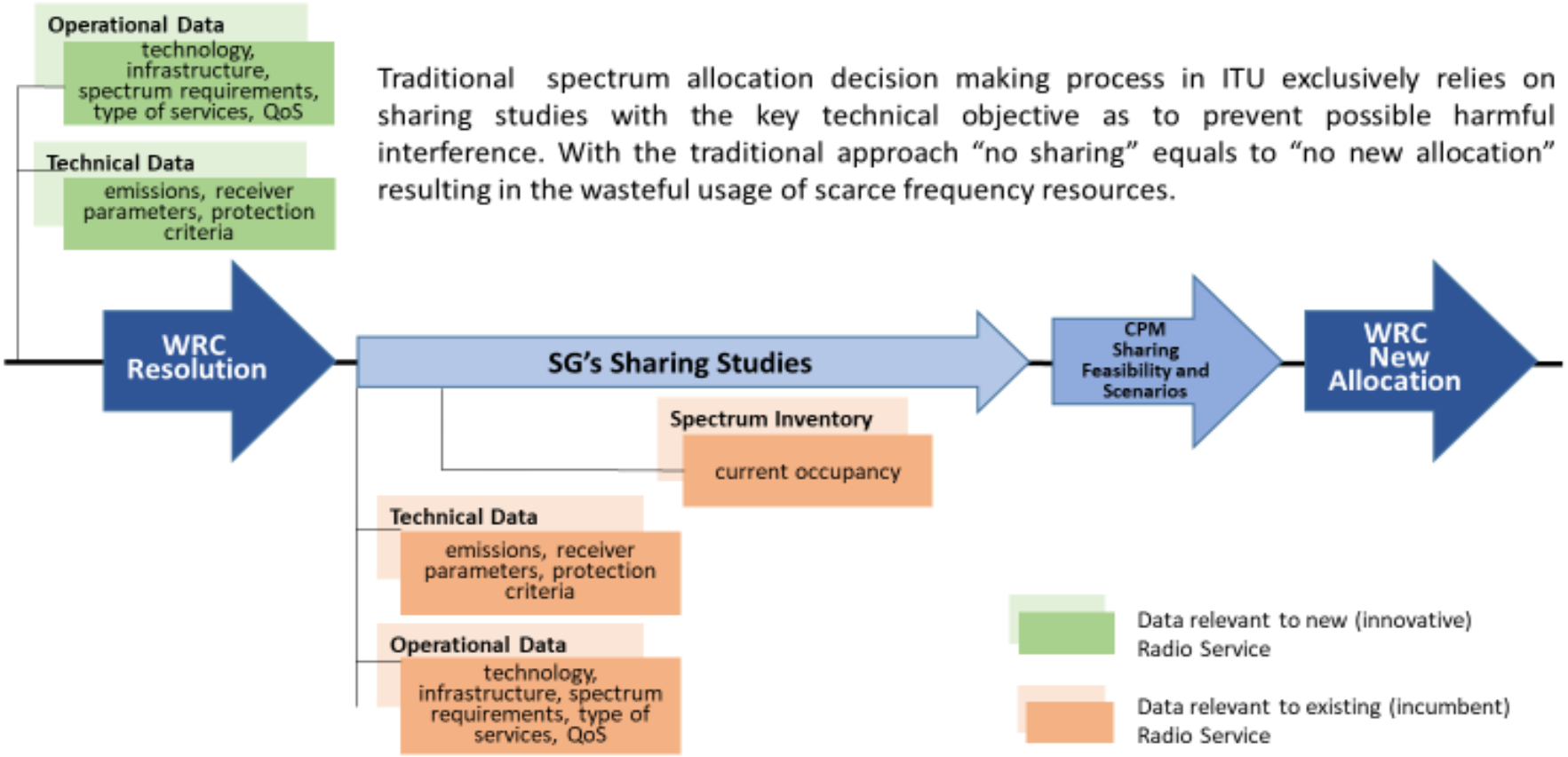
Spectrum management is the complex task aimed on establishing proper conditions for efficient utilization of radio frequency resources.

Fundamental policy objectives of spectrum management require consistency in regulatory approaches to matters such as access rights, competition, non-discrimination, user protection, equity and fairness in the manner bands are allocated and frequencies are assigned.

Spectrum management tasks could be attributed to different levels of regulation with ITU at the highest level

Level 1	• ITU allocates spectrum bands to Radio Services (or range of services)
Level 2	• National Administration awards spectrum resources to service providers
Level 3	• Service providers use spectrum resources to deliver services
Level 4	• End-users are consuming service

Spectrum Management Level 1



RR interference

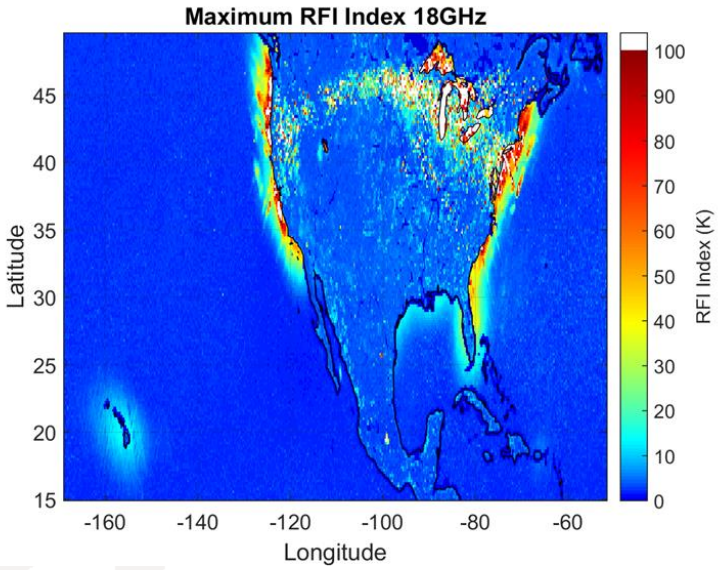
- If harmful interference caused by the use of a frequency assignment which is not in conformity with RR , the station using the latter frequency assignment must immediately eliminate this harmful interference (RR 8.5).
- Administrations are urged to exercise the utmost goodwill and mutual cooperation (Article 15)
- Infringement shall be reported (RR Appendix 9)
- Forms-RR Appendix 10, passive sensors- Report ITU-R 2181 sensor
- Radio Regulatory Board
- Assistance of Radicommunication Bureau

RR Radiomonitoring

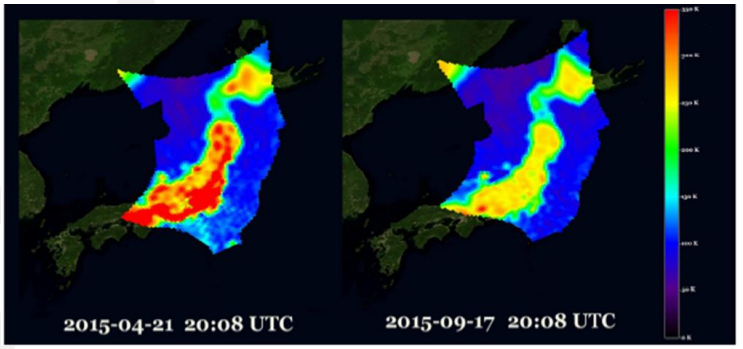
- Publication LIST VIII- contacts and functions of radiomonitoring stations
- Regular and special programmes:
  - clearance of unauthorized or out-of-band operations;
  - assistance to administrations;
  - guidance to administrations in selecting frequencies;
  - preparation for Radiocommunication Conferences
- Permanent monitoring programmes- 2 850 and 28 000 kHz, 406-406.1 MHz

Current challenges

- Spectrum/orbit scarcity
- Non-conformity- Met Radars vs WLAN RFI (5600-5650 MHz)
- New RFI scenarios
  - NGSO, HAPS, earth station on move
  - TV receivers (1400-1427 MHz)
  - Reflection (18.6-18.8 GHz)
- Spectrum efficiency ???



Maximum RFI index 1400-1427 MHz



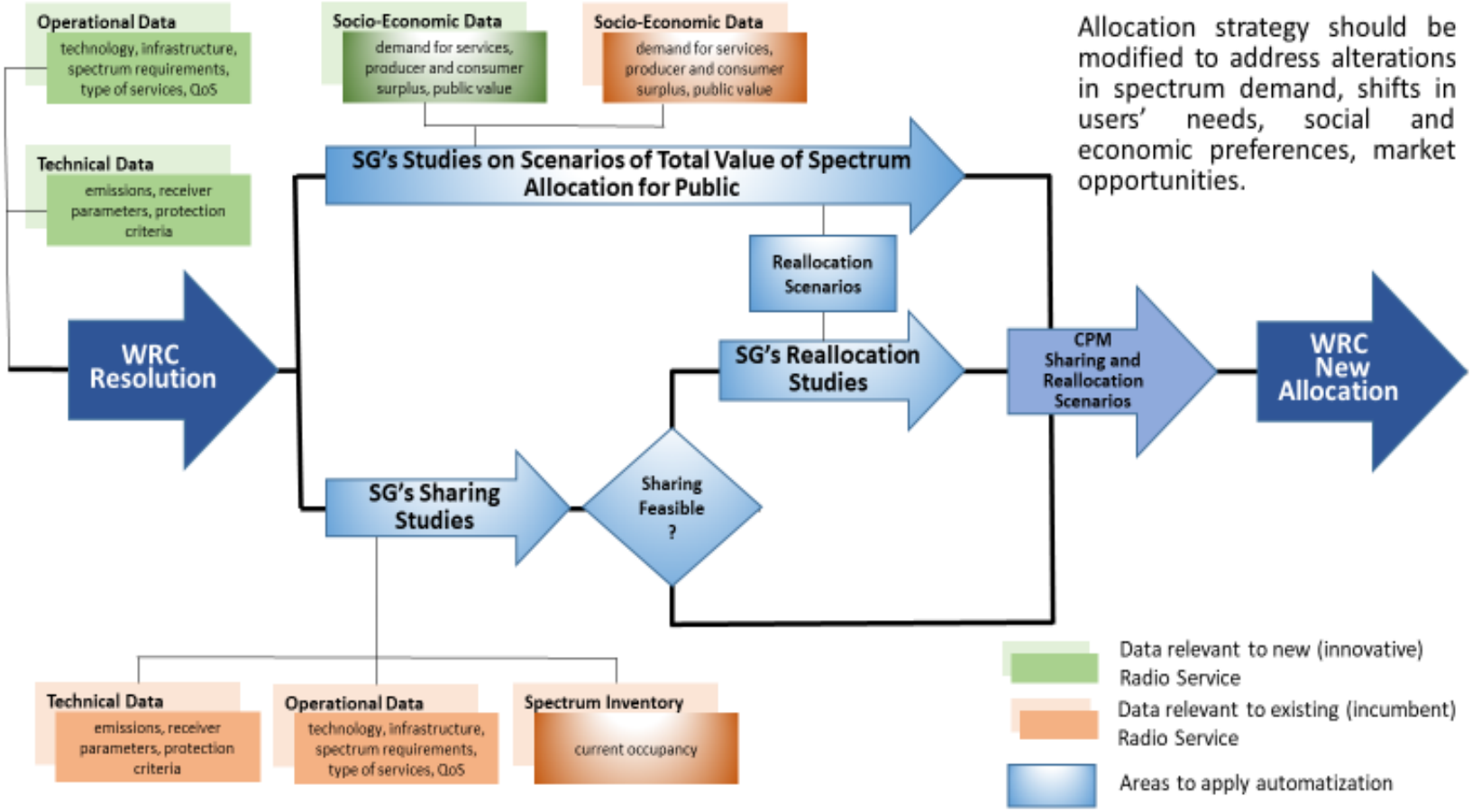
Spectrum efficiency

The U.S. Congress (1993) "the FCC cannot make allocation or service decisions based on the expectation of public revenue from auctions."

$$E_k(x_k,t) = \frac{\sum_{i=1}^{N} \varphi_i\,(x_i,t)}{C_k\,(x_k,t) + \sum_{i=1}^{N} CT_i\,(x_i,t) + \sum_{i=1}^{N} CE_i(x_i,t)}$$

$E_k(x_k, t)$- spectrum efficiency of the band x_k
$\varphi_i(x_i,t_i)$ – economic value of spectrum use by system i
$C_k(x_k,t)$ – administrative spectrum costs of the band x_k
$CT_i\,(x_i,t)$ – transaction spectrum costs
$CE_i\,(x_i,t)$ – negative externalities costs .

Agenda for the future



Agenda for the future

- Automatization and transformation of ITU-R study activity
- Technical characteristics and criteria to be maintained and updated
- Essential spectrum requirements
- Enforcement measures
- Further development of international radiomonitoring system

Thank you