



# Spectrum management for Radio Astronomy in Europe

Hans van der Marel

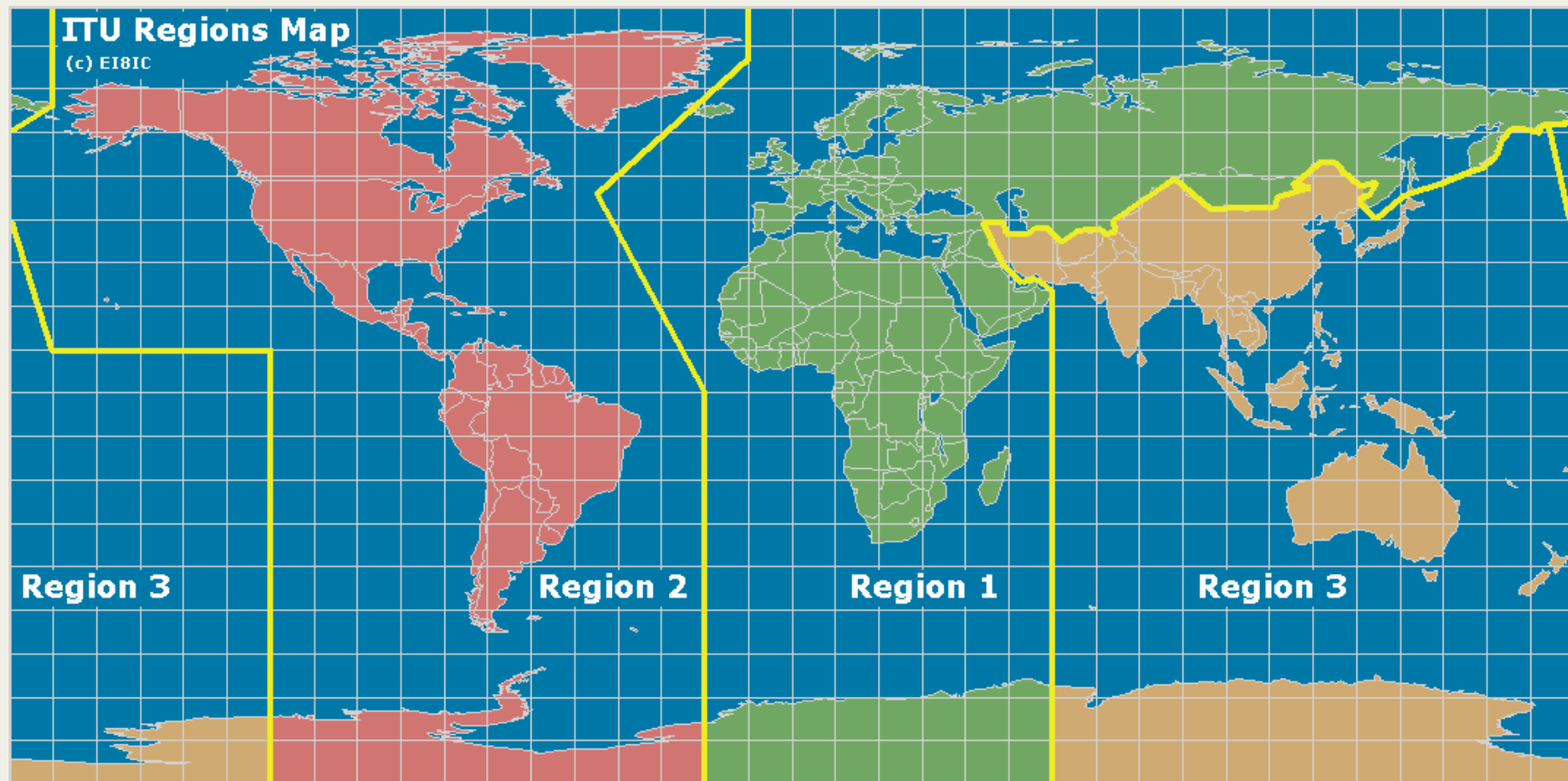
ASTRON / CRAF



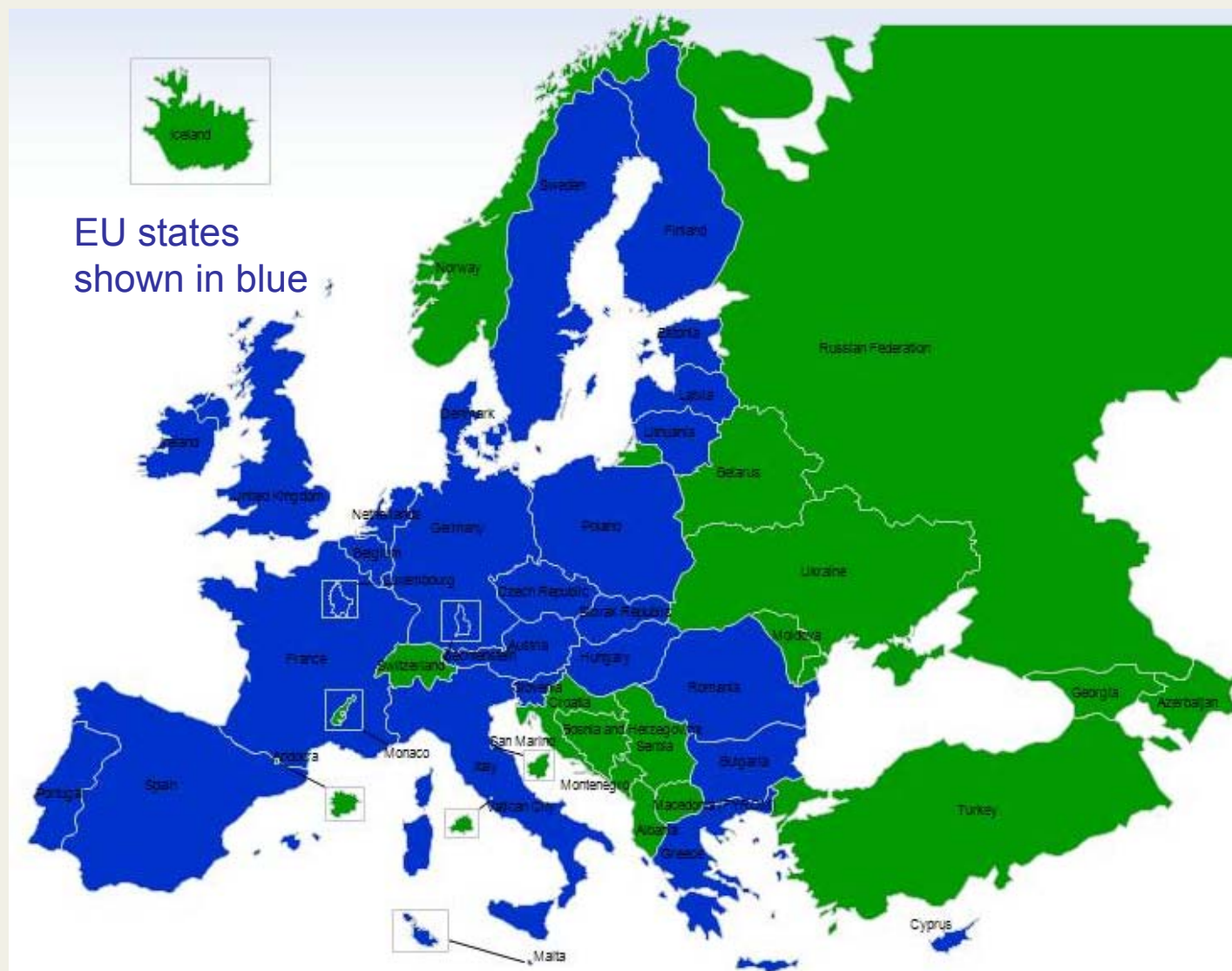
# Outline

- ITU Region 1
  - Europe
    - CEPT/ECC
    - EU/EC
    - ETSI
    - CRAF

# ITU regions



# Europe



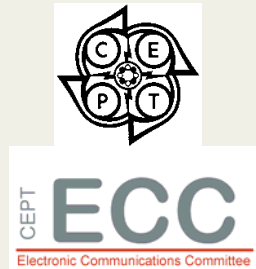
EU states  
shown in blue

48 CEPT  
countries

28 EU  
countries

# Regulatory environment in Europe

- **CEPT/ECC:**



- Frequency allocations/conditions of use
- ECC Decisions (non mandatory, but binding for those members implementing the decision)
- ECC Recommendations, ECC Reports, CEPT Reports

- **European Union (EU) / European Commission (EC):**



- Regulations on market & competition
- General radio spectrum policy (trading, etc.)
- EC Decisions (mandatory)

- **ETSI:**



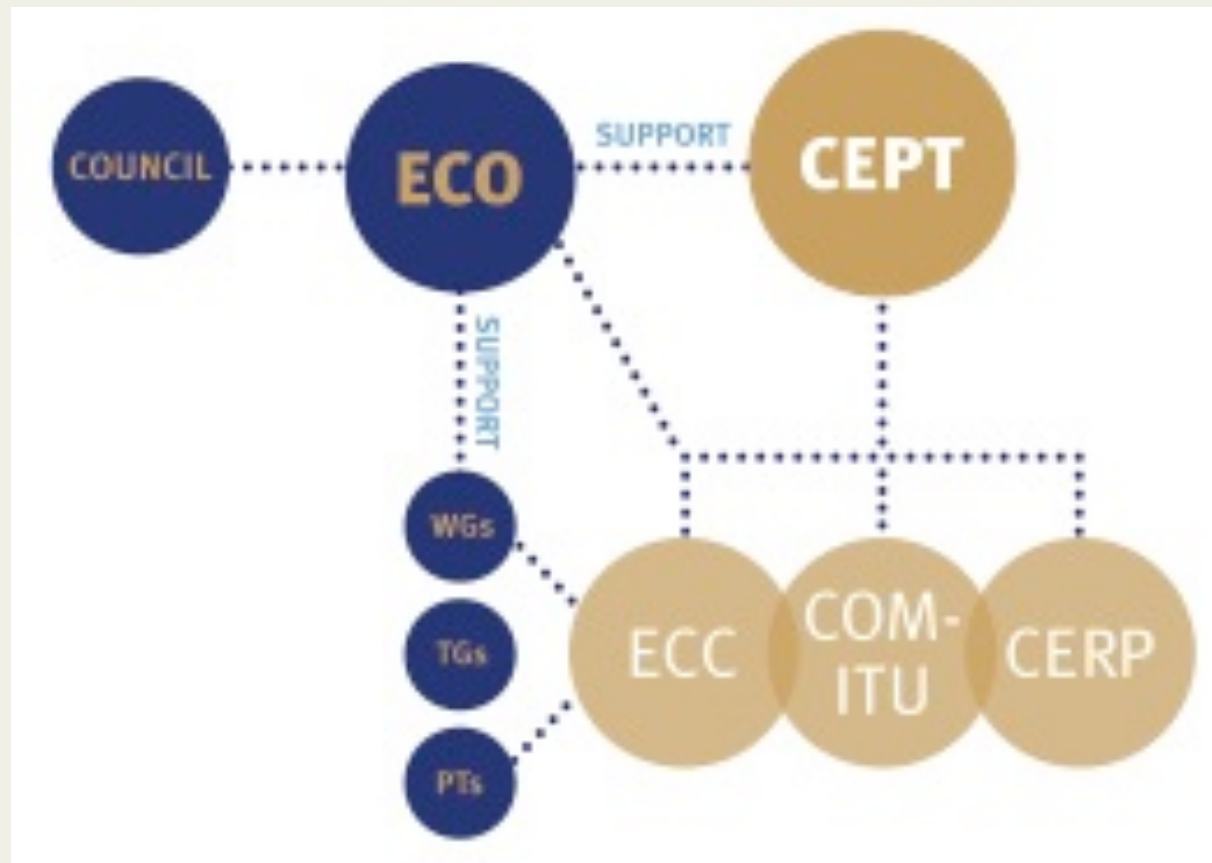
- Harmonised standards (conformity, interoperability)



# European Conference of Postal and Telecommunications Administrations (CEPT)

- **ECC** Electronic Communications Committee: telecommunications harmonisation and European co-ordination and preparation for ITU-R meetings
- **Com-ITU** Committee for ITU Policy: European co-ordination for ITU meetings
- **CERP** European Committee for Postal Regulation: postal regulation, as well as European co-ordination and preparation for meetings of the Universal Postal Union (UPU)

# Structure CEPT



# WGs, PTs, TGs

- Working Groups (WGs)
  - The Working Groups provide a forum for consensus building among European interests in electronic communications. They also provide a focus for harmonising European views for use in the International Telecommunication Union (ITU).
- Project Teams (PTs)
  - Project Teams may be established by the Plenary and its Working Groups to work on well-defined tasks for limited time periods.
- Task Groups (TGs)
  - The Plenary may identify urgent priority items as items for a Fast Track Approach and establish a Task Group to progress such an issue.



# ECC

- Development of ECC Regulations
- Cooperation with other European regulatory bodies (ETSI and EC)
- Structure:
  - WG Frequency Management (WG FM)
  - WG Spectrum Engineering (WG SE)
  - WG Regulatory Affairs (WG RA)
  - WG Working Group Numbering and Networks (NaN)
  - Conference Preparatory Group (CPG)
  - ECC PT1 "IMT matters"
  - TG 5 "ECC Structure"

# WG FM – Project Teams (PTs)

- Short Range Devices Maintenance Group (SRD/MG)
- EFIS Maintenance Group
- FM22: Monitoring
- FM38: PMR (including harmonised DMO Channels)
- FM44: Satellite Communications
- FM45: Digital Broadcasting Issues
- FM46: Maritime Issues
- FM47: Ultra Wideband Issues
- FM48: Spectrum aspects for Broadband Direct-Air-to-Ground Communications (DA2GC) systems

## WG SE – Project Teams (PTs)

- SE7: Compatibility and sharing issues of MS (except IMT2000) operating below 3GHz
  - SE19: Broadband applications in Fixed Service
  - SE21: Unwanted Emissions
  - SE24: Short Range Devices
  - SE40: Space services' compatibility issues
  - STG - SEAMCAT Technical Group
  - Forum Group on Wind Turbines
  - Forum Group on Spectrum Engineering
- Reference Document

# CPG Project Teams

WRC-15 AI are distributed among PTs:

- PTA: AI 1.3, 1.11, 1.12, 1.13, 1.14, 2, 4
- PTB: AI 1.6, 1.7, 1.8, 1.9.1, 1.9.2, 1.10, 7, 9
- PTC: AI 1.4, 1.5, 1.15, 1.16, 1.17, 1.18
- PTD: AI 1.1, 1.2

Deliverables:

- CEPT Briefs
- European Common Proposals for the work of the Conference (ECPs)

# ECC deliverables

- **Decisions**

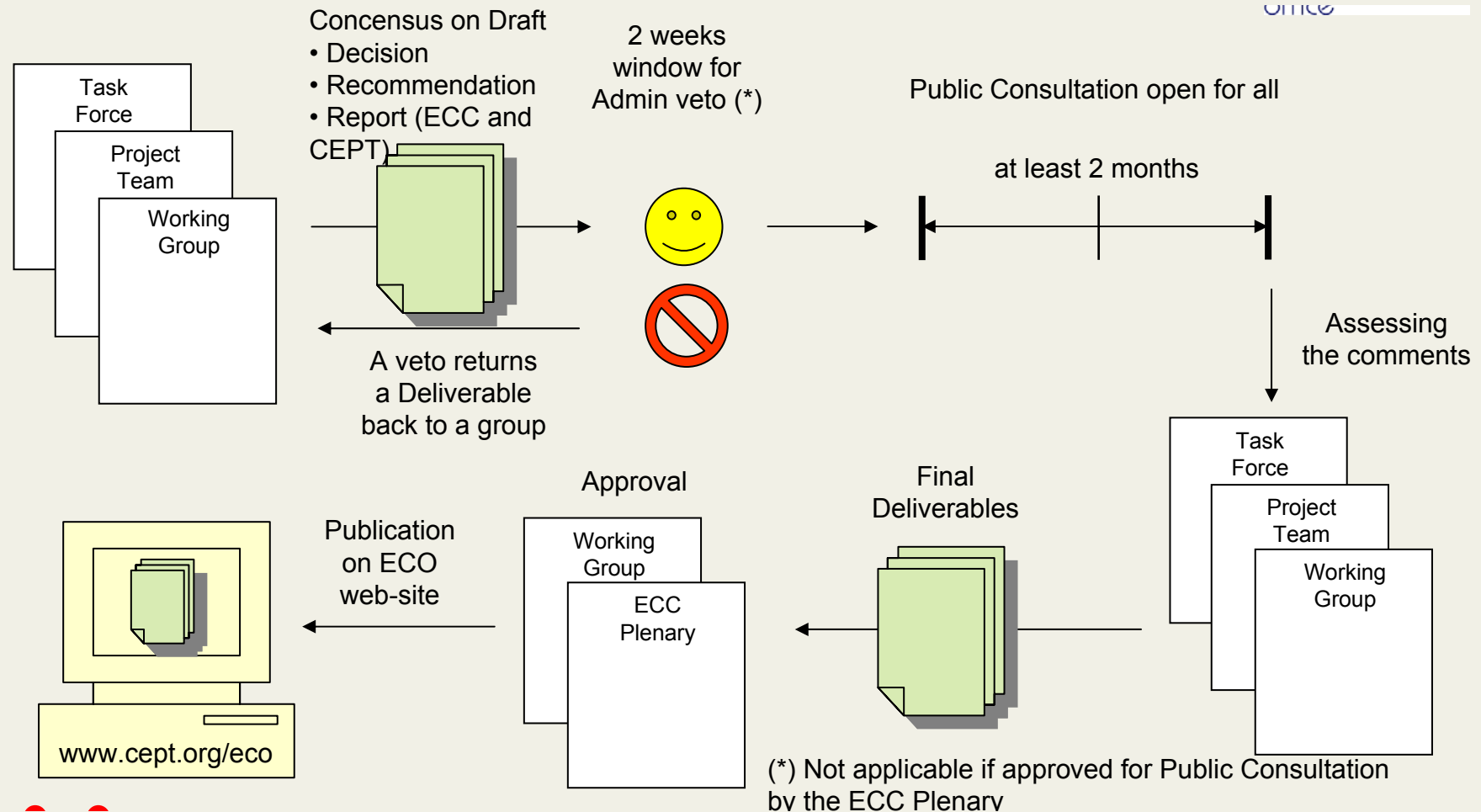
- Aim at harmonisation in electronic communications regulatory field:
  - “Designate” a frequency band for harmonisation matters.
  - Voluntary basis: Members implementing the Decision commit themselves

- **Recommendations**

- Measures which administrations are encouraged to apply
- Harmonisation measures for those matters where Decisions are not yet relevant or to provide guidance to national administrations

- **ECC Reports:** Result of studies by the ECC normally in support of a harmonisation measure
- **CEPT Reports:** Result of studies by the ECC in response to Mandates from the EC.

# Flow of ECC Deliverables



# European Union / European Commission

The **Digital Agenda** is the EU's strategy to help digital technologies, including the internet, to deliver sustainable economic growth.

The **Digital Agenda** of the EU is managed by the European Commission Directorate General for Communications Networks, Content & Technology (DG-Connect).

→ Radio Spectrum Policy Program (pushing IMT)

# RSPG

- Radio Spectrum Policy Group (2002):
  - High-level advisory group that assists the EC in the development of radio spectrum policy
  - Can also be requested by European Parliament and/or Council for opinions or reports
  - Members: Senior representatives of Member states and the official representative of the EC



# RSC

- Radio Spectrum Committee (2002):
  - Assist EC for development of technical implementing decisions to ensure harmonised conditions across Europe for availability and efficient use of radio spectrum
  - Develops measures to ensure that information on use of spectrum is provided accurately and timely
  - May issue mandates to CEPT
  - Composed of Member State representatives and chaired by EC



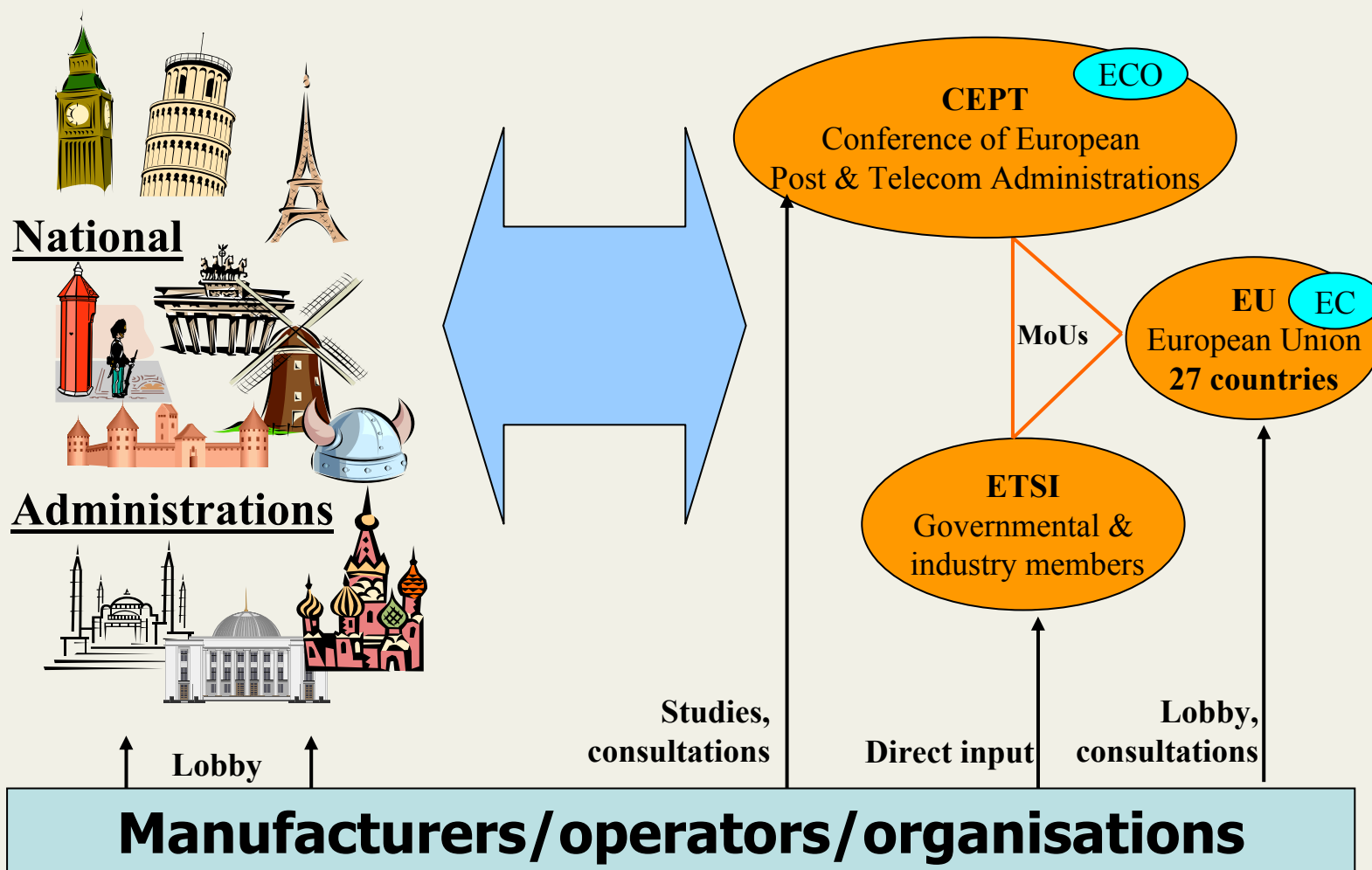
# ETSI: European Telecommunications Standards Institute

- The ETSI was created by CEPT in 1988 and is based in Sophia Antipolis, France
- Produces standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies
- ETSI is a not-for-profit organization with more than 700 ETSI member organizations drawn from 62 countries across 5 continents world-wide.

# ETSI

- Recognized by the European Union as a European Standards Organization
- Founded initially to serve European needs, ETSI has become highly-respected as a producer of technical standards for worldwide use
- Collaboration with other standardisation organisations: IEEE
- "Inspire" 3GPP (Mobile phone)

# European Spectrum Management



# Spectrum Management for Radio Astronomy in Europe

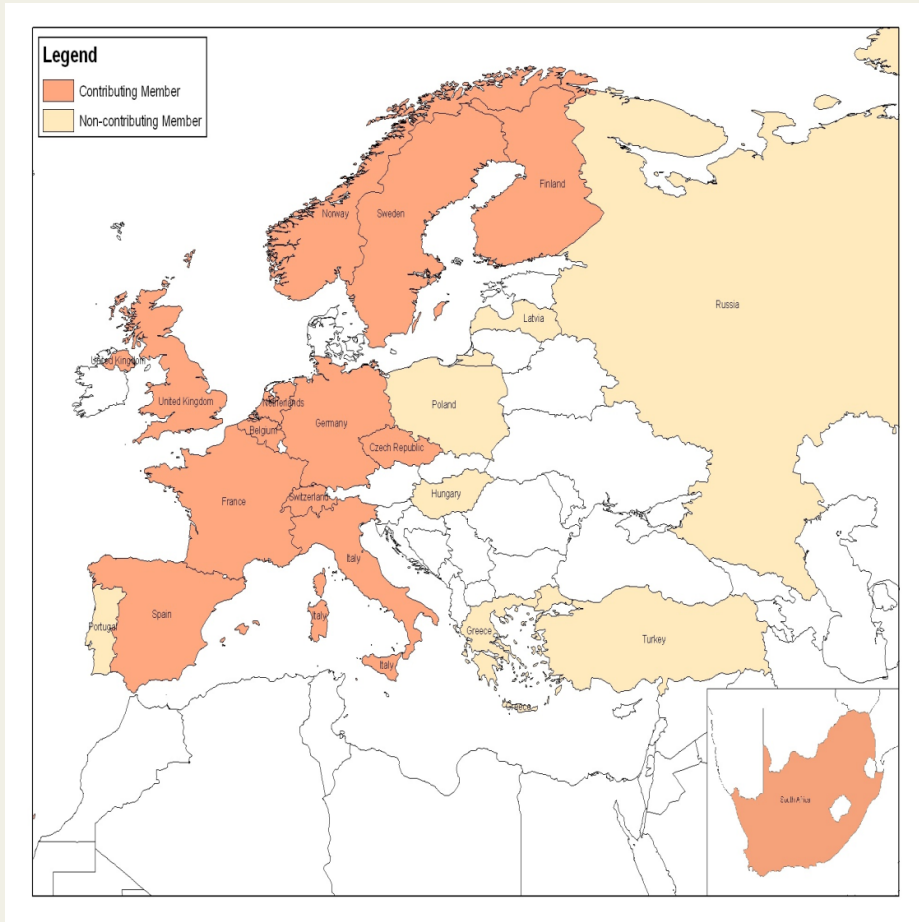
- CRAF: Committee on Radio Astronomical Frequencies
- Expert committee of ESF
- Established in 1988
- Chairman: Hans van der Marel (ASTRON)
- Frequency Manager (funded by contributions): Talayeh Hezareh (MPIfR)
- Sector member of ITU-R
- Formal observer status within the CEPT

# CRAF Mission

The mission of CRAF is:

1. to **keep** the frequency bands used for radio astronomical observations free from interference;
2. to **argue** the scientific needs of the European research community for continued access to and availability of the radio spectrum for radio astronomy; and
3. to **support** related science communities in their needs concerning interference-free radio frequency bands for passive use.

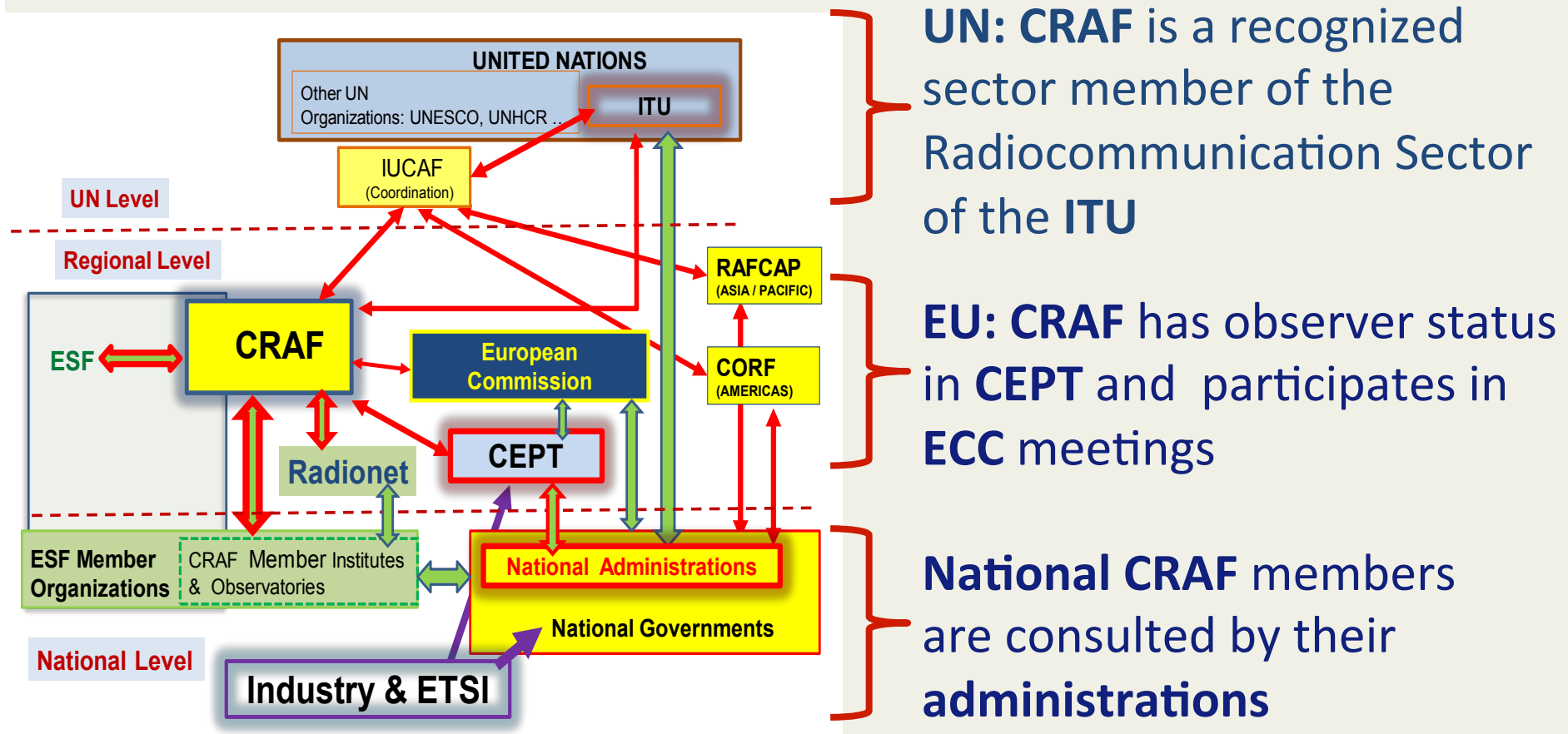
# CRAF Member Organisations



- 20 member countries (incl. Russia, Ukraine, Turkey and South Africa)
- ~50 observatories and institutes including
  - European Space Agency (ESA)
  - European Incoherent Scatter Scientific Association (EISCAT)
  - Institut de Radio Astronomie Millimétrique (IRAM)
  - International VLBI Service for Geodesy and Astrometry (IVS)



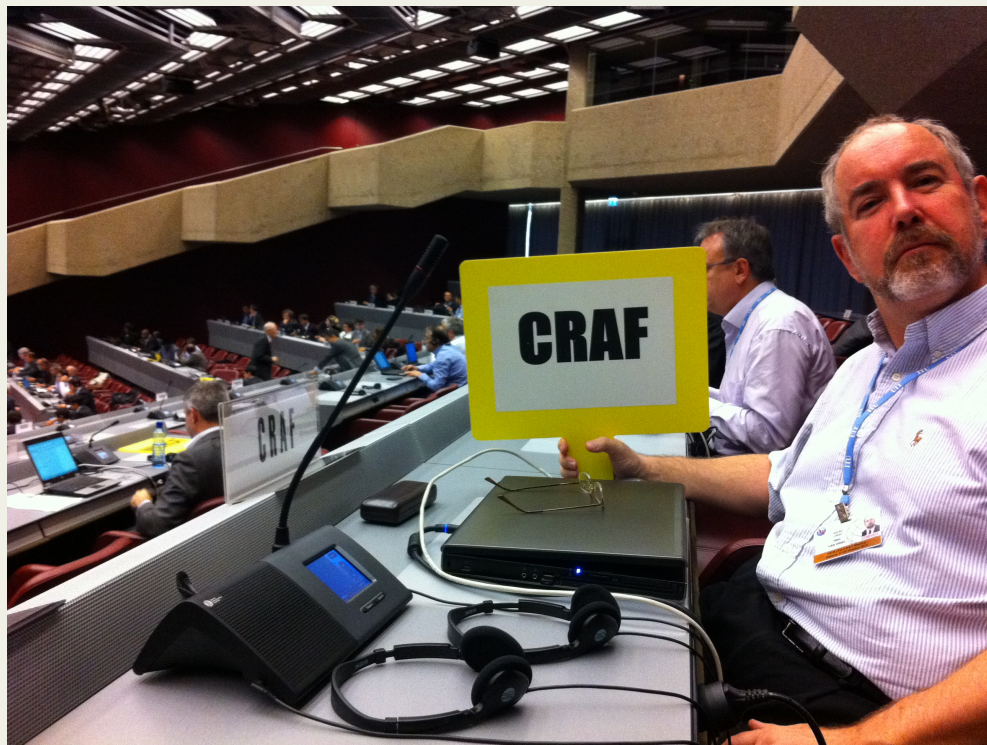
# Three layers of decision making



# Publications

- CRAF news letter (1-2 x year)
- Input documents to CEPT and ITU
  - Important to get support from administrations
- Views on EU public consultations
- Position document on WRC AI
  - Input document for CPG
  - Members input it to national CPM process
- CRAF handbook for radio astronomy  
<http://www.craf.eu/CRAFhandbook3.pdf>
- CRAF website: <http://www.craf.eu/>

Any questions?



**CRAF**  
Committee on Radio Astronomy Frequencies

**ASTRON**