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CEPT sharing studies in the UHF band

**European Communications Office
Marc Le Devendec**

**ITU-D Regional Development Forums 2010 for the
Africa region on
"Modern spectrum Management and Transition from Analogue
to Digital Broadcasting – Trends and Technologies"
Banjul (Gambia), 14-16 July 2010**



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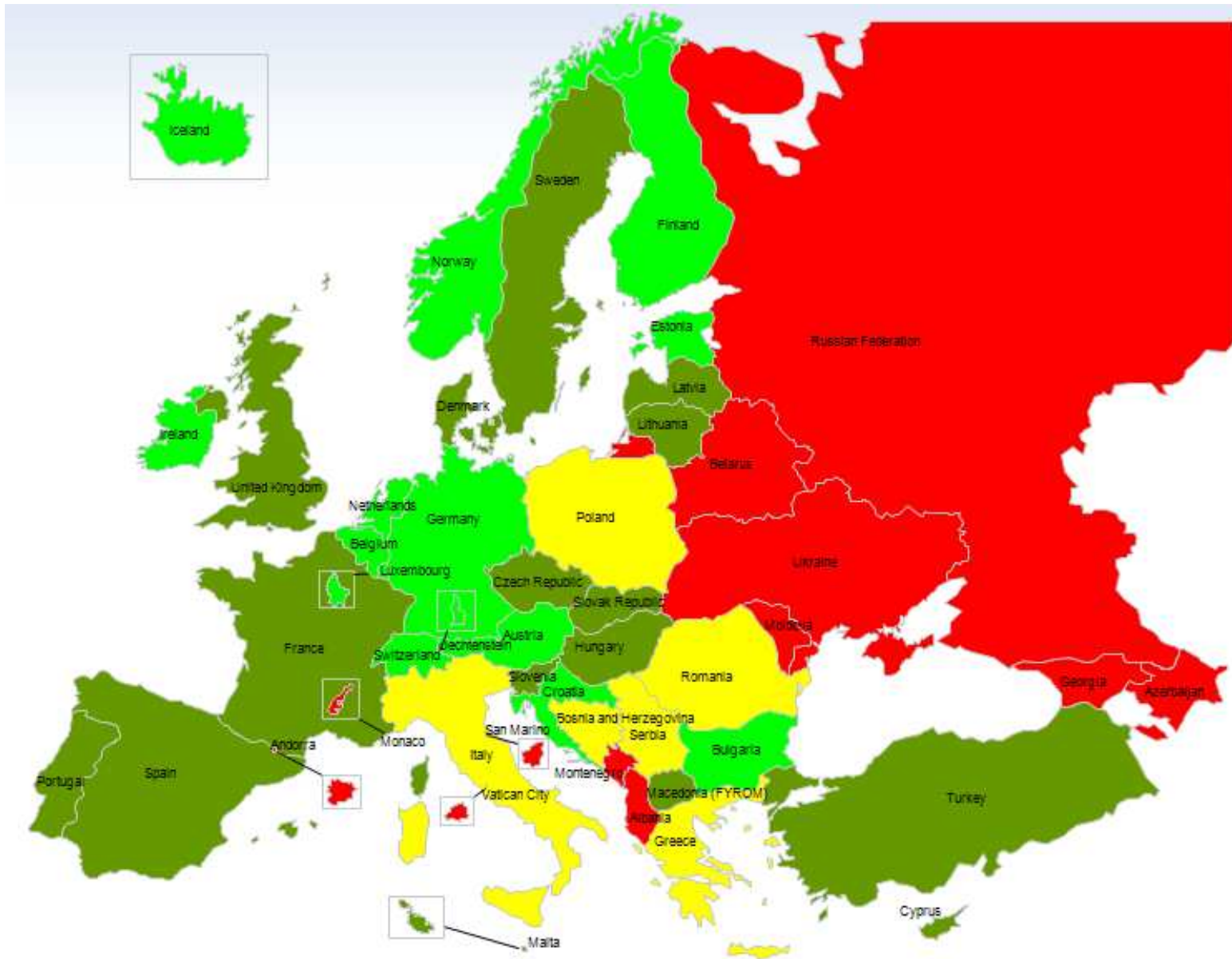
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- CEPT
- ECC
- UHF overview in CEPT
- Sharing studies





Why CEPT? (1)

- Establish a European forum for discussions on sovereign and regulatory issues in the field of post and telecommunications issues
- Provide mutual assistance for the members with regard to the settlement of sovereign/regulatory issues
- Exert an influence on the goals and priorities in the field of European Post and Telecommunications through common positions
- Shape, in the field of European posts and telecoms, those areas falling into its responsibilities
- Carry out its activities at pan-European level
- Strengthen and foster more intensive co-operation with Eastern and Central European countries



Why CEPT? (2)

- Promote and facilitate relations between European regulators (e.g. through personal contacts)
- Influence, through common positions, developments within ITU and UPU in accordance with European goals
- Respond to new circumstances in a non-bureaucratic and cost-effective way and carry out activities in the time allocated
- Settle common problems at committee level, through close collaboration between its committees
- Give its activities more binding force, if required, than in the past; creating a single Europe in post and telecommunication sectors



Some Achievements in the radio field...

- GSM in 900 and 1800 MHz
- UMTS/IMT in 2 GHz
- DECT in 1880-1900 MHz
- TETRA PMR/PAMR in 400 and 800 MHz
- WAS/RLANs in 5 GHz
- ECC Rec. 70-03: Frequency bands and regulations for Short Range Device



Structure of CEPT

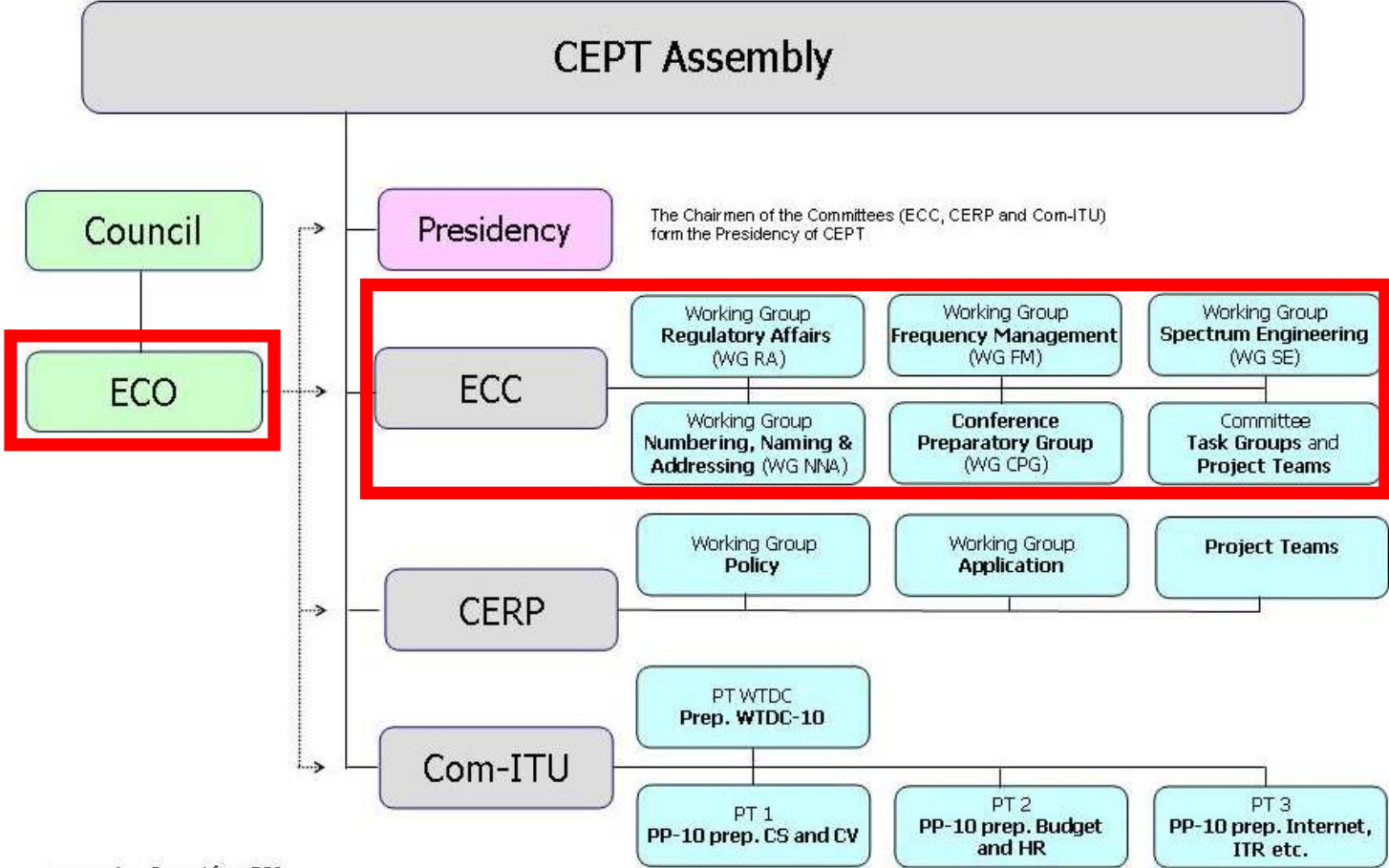
- Three Committees:
 - The Electronic Communications Committee (ECC), responsible for telecommunications harmonisation, as well as European coordination and preparations for World Radiocommunication Conferences;
 - The European Committee for Postal Regulation (CERP), responsible for postal regulation, as well as European coordination and preparation for meetings of the Universal Postal Union (UPU); and
 - The Committee for ITU Policy (Com-ITU), responsible for the European coordination and preparation for Meetings of the Council, Plenipotentiary Conferences, World Telecommunication Development Conferences, World Telecommunication Standardisation Assemblies of the International Telecommunication Union (ITU)



CEPT Organisation



european communications office



-----> Support from ECO

ECO is the permanent Office of CEPT established in Copenhagen

Updated: September 2009



Partners through MoU

- European Commission (EC)
- Asia-Pacific Telecommunity (APT)
- Arab Telecommunications Council of Ministers/League of Arab States (ATCM)
- **African Telecommunications Union (ATU)**
- Organization of American States for the Inter-American Telecommunication Commission (CITEL)
- Regional Commonwealth in the field of Communications (RCC)
- International Maritime Organisation (IMO)



ECC: Electronic Communications Committee

- 1. Consider and develop policies on electronic communications activities in a European context, taking account of European and international legislation and regulations;
- 2. Develop European common positions and proposals, as appropriate, for use in the framework of international and regional bodies;
- 3. Forward plan and harmonise within Europe the efficient use of the radio spectrum, satellite orbits and numbering resources, so as to satisfy the requirements of users and industry;
- 4. Take decisions on the management of the work of the ECC;



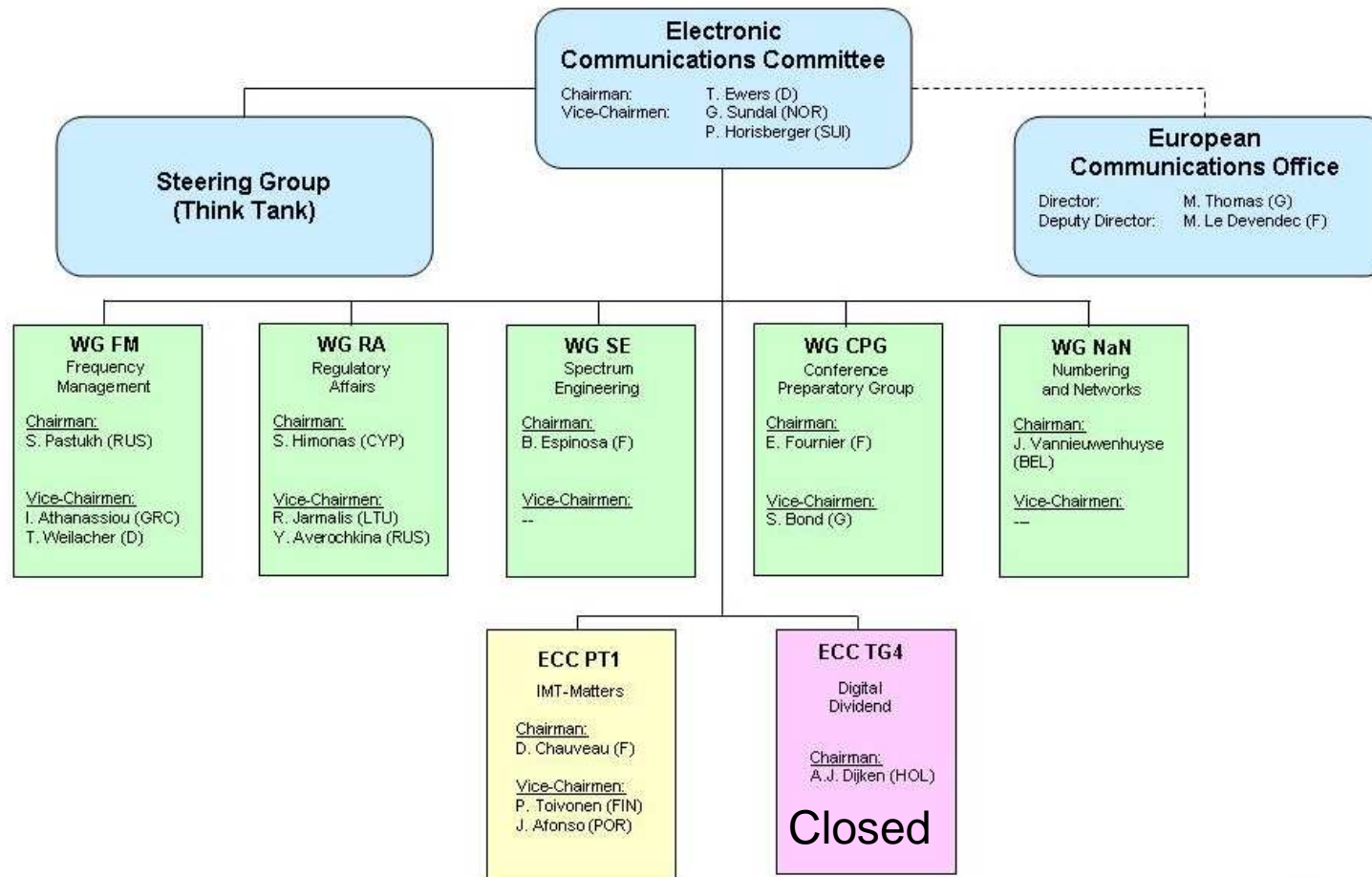
- 5. approve Decisions and other deliverables;
- 6. implement the strategic decisions of the CEPT Assembly;
- 7. seek guidance from the CEPT Assembly, as and when necessary, and propose issues for consideration by the CEPT Assembly;
- 8. where relevant, establish contacts with equivalent organisations outside of Europe;
- 9. report to the CEPT Assembly on the progress of its work.
- In carrying out these activities, the ECC shall establish close cooperation and consultation with relevant European bodies, in particular with the European Commission and the European Free Trade Association.

Structure of ECC

- WG FM: Frequency Management
- WG RA: Regulatory Affairs
- WG SE: Spectrum Engineering
- WG CPG: WRC preparations
- WG NNA: Numbering and Networks
- ECC PT1: IMT (International Mobile Telecommunications)
- ECC TGs: specific issues (Ultra Wide Band devices, Digital Dividend...)



Organisation



Updated: June 2010

The regulatory environment in Europe



CEPT:

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



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

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

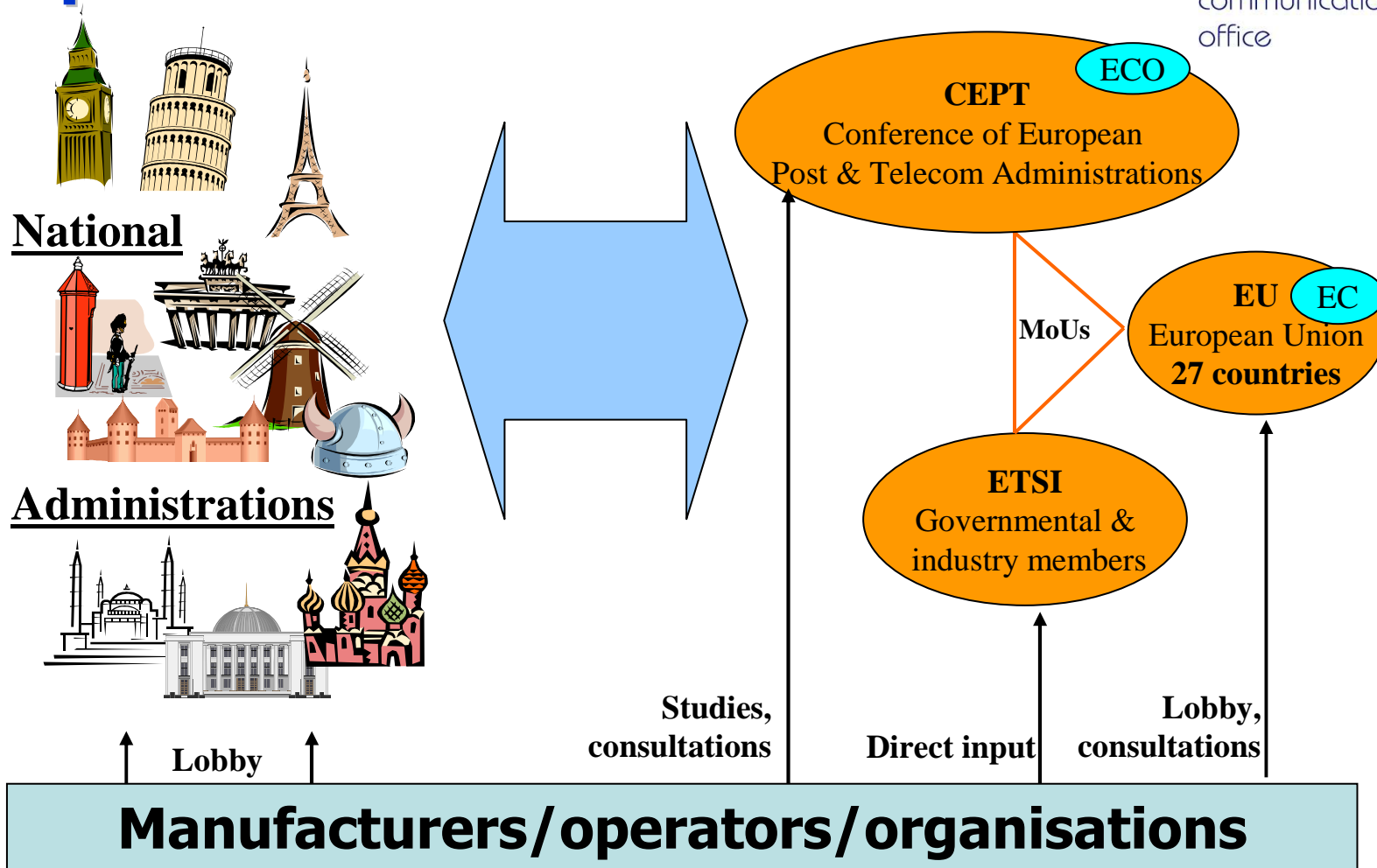


ETSI:

- Harmonised standards (conformity, interoperability)



The regulatory environment in Europe



UHF Case in Europe

- Transition from analogue to digital was considered in the preparation of the GE06 Plan in bilateral and multilateral meetings
- GE06 provides the Regulatory and Technical Frameworks for the introduction of digital TV
- Transition period shall end 17 June 2015
- In order to progress the change from analogue to digital TV, the European Commission has designated 2012 as the year by which analogue terrestrial TV transmissions will cease in Europe.



Announced Analogue switchover dates



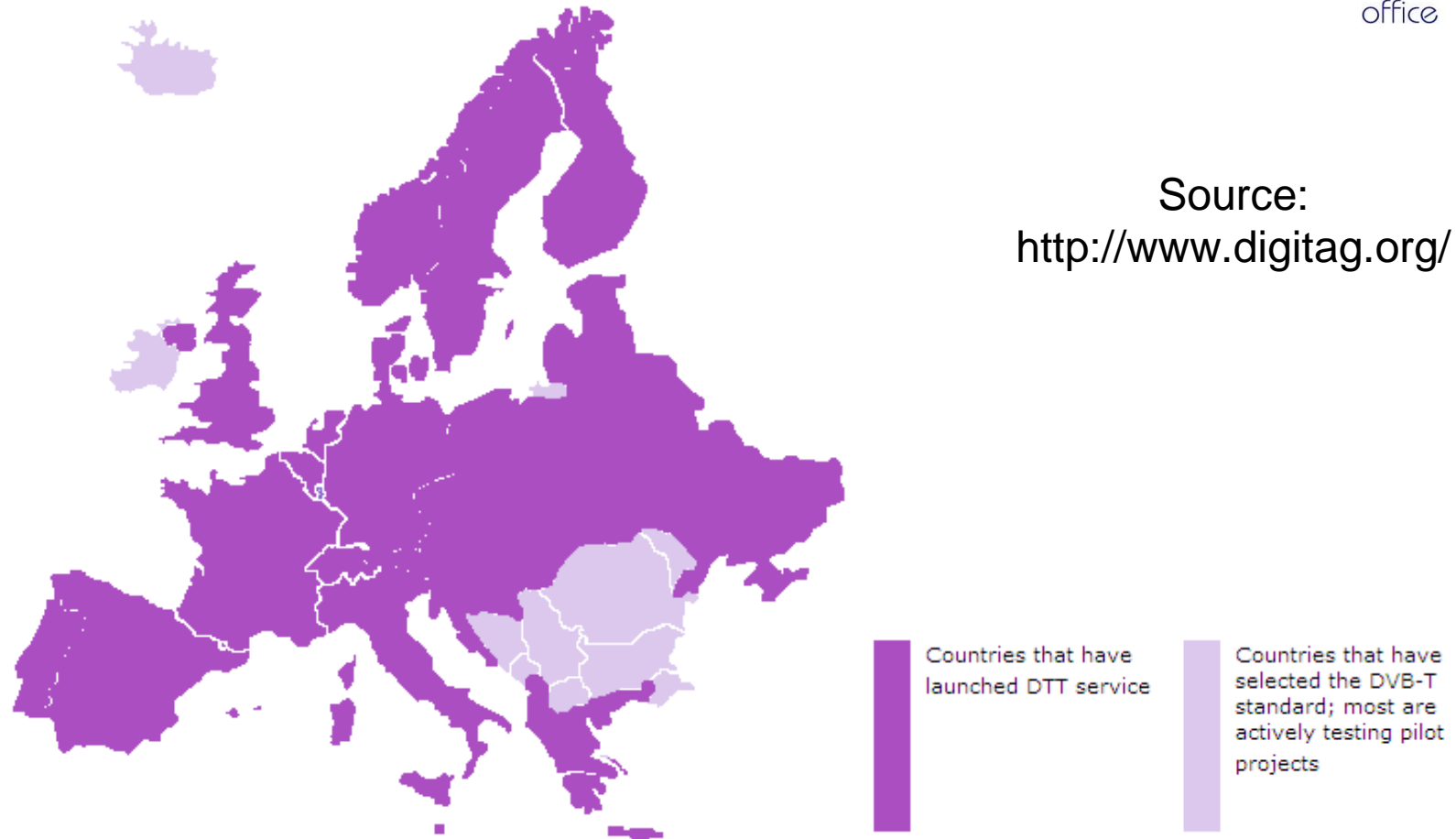
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Country	Launch date	Compression format	Completion of ASO
UK	1998	MPEG-2	2012
Sweden	1999	MPEG-2	Completed
Spain	2000/ 2005	MPEG-2	2010
Finland	2001	MPEG-2	Completed
Switzerland	2001	MPEG-2	Completed
Germany	2002	MPEG-2	Completed
Belgium (Flemish)	2002	MPEG-2	Completed
NL	2003	MPEG-2	Completed
Italy	2004	MPEG-2	2012
France	2005	MPEG-2/MPEG-4 AVC	2011
Czech Republic	2005	MPEG-2	2011
Denmark	2006	MPEG-2/MPEG-4 AVC	Completed
Estonia	2006	MPEG-4 AVC	2010
Austria	2006	MPEG-2	2010
Slovenia	2006	MPEG-4 AVC (TBC)	2011
Norway	2007	MPEG-4 AVC	Completed
Lithuania	2008	MPEG-4 AVC	2012
Hungary	2008	MPEG-4 AVC	2011
Ukraine	2008	MPEG-4 AVC	2014
Latvia	2009	MPEG-4 AVC	2010
Portugal	2009	MPEG-4 AVC	2012
Croatia	2009	MPEG-2	2011
Poland	2009	MPEG-4 AVC	2013
Slovakia	2009	MPEG-2	2012
Ireland	2010	MPEG-4 AVC	2012
Russia	TBC	MPEG-4 AVC	2015

Source:
<http://www.digitag.org/>



Introduction of DTT



Source:
<http://www.digitag.org/>



UHF band

- GE06: Framework for the introduction of Digital TV
- Prior to WRC-07
 - Broadcasting
 - Other Primary Services (ARNSS)
 - Secondary: Programme Making and Special Events (PMSE)
- The introduction of Digital TV should allow to release spectrum for new Services in the UHF band



First EC Mandate (beginning of 2007)

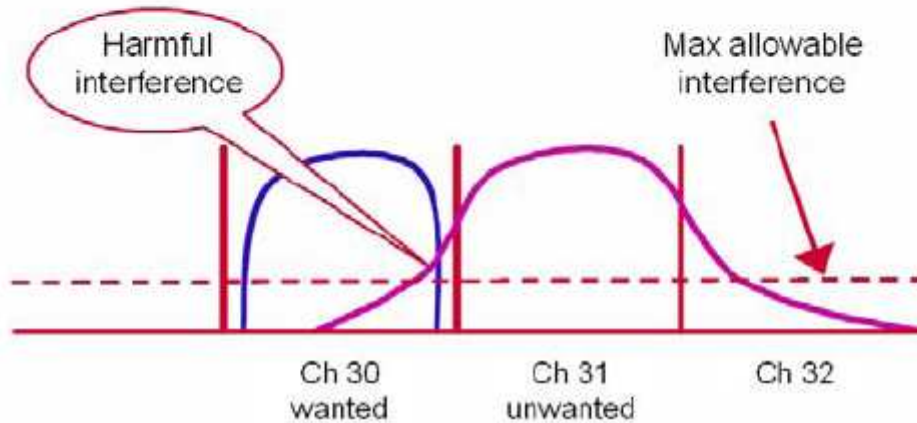
- First EC Mandate on Digital Dividend included:
 - Compatibility issues between "cellular / low power transmitter" networks and "larger coverage / high power tower" type of networks (i.e. practical coexistence between high and low power density networks (i.e. coexistence of RPC-1 and RPC-2/3 configurations in adjacent channels)
 - on the possibility of harmonising a sub-band of bands IV and V for multimedia applications, minimizing the impact on GE06 plan.
- Work lead by ECC TG4 in CEPT



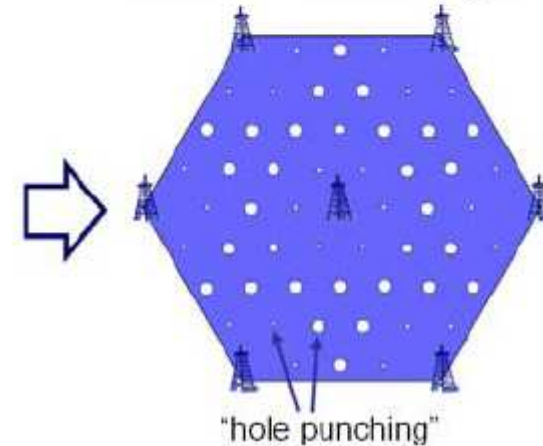
Issue



Adjacent channel interference



DVB-T coverage





RPC 1



RPC 2 and RPC 3



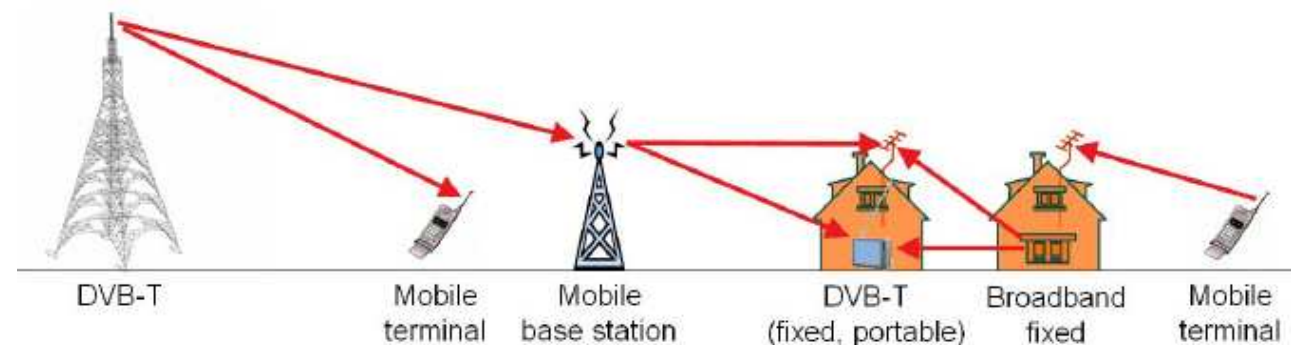
CEPT Report 21

- Domestic issue
- Risk of adjacent channel interference exists only in close vicinity of the interfering multimedia broadcasting transmitter, located within the coverage area of the non-co-sited service.
- Different methods can be used on an area by area basis in order to minimise the impact of adjacent channel interference.
 - Use of cross polarization
 - Use of critical spectrum mask (as defined in the GE06 Agreement) for the multimedia broadcasting service transmitter.
 - Adjusting the power of the interfering multimedia broadcasting transmitter
 - ...
- GE06 Plan and its provision allow the deployment of mobile multimedia applications and the implementation through GE06 minimizes the impact on the current status of GE-06 Plan. Since this plan may evolve continuously through the application of its modification procedure, it is possible for it to evolve towards a harmonised sub-band for mobile multimedia applications.



First EC Mandate...

- Technical feasibility of harmonising a sub-band of bands IV and V for mobile applications (including uplinks), minimizing the impact on GE-06
- CEPT Report 22:
 - Co-channel interference between fixed/mobile and DVB-T networks
 - Adjacent channel interference between fixed/mobile and DVB-T networks



Main outputs

- Harmonisation of a sub-band of the UHF band for mobile communication applications (i.e. including uplinks) is feasible from a technical, regulatory and administrative point of view, provided that it is not made mandatory and any decision about use of the harmonised sub-band is left to individual Administrations.
- The Preferred sub-band for such harmonisation is the upper part of the UHF band, and should include, as a minimum, the range of channels 62 - 69 (798 - 862 MHz). The use of the harmonised sub-band for mobile communication applications should be subject to harmonised technical arrangements (e.g. band plans, options for the location of any duplex gap and spacing, and any guard bands required, for both FDD and TDD use).
- Implementation will require bilateral or multilateral negotiations, under the procedures of the GE-06 Agreement.



WRC-07

- WRC-07 Agenda Item 1.4: Extension of the Allocation to Mobile Service (790 – 862 MHz)
- Remaining issues:
 - Sharing between Mobile and others users in 790 – 862 MHz
 - WRC Agenda Item 1.15 (CPG PTD / JTG 5-6)
 - Compatibility between PMSE and Mobile Service
 - Band Plans (ECC PT1 / WP 5D)



Completion of the First EC Mandate

- CEPT Report 23: Technical Options for the Use of a Harmonised Sub-Band in the Band 470 - 862 MHz for Fixed/Mobile Application (including Uplinks)
 - Example band plans for the fixed/mobile services in the harmonised sub-band. The most suitable arrangements vary depending on the system or technology to be implemented in the harmonised frequency range
 - Additional technical elements:
 - Measurements on protection ratios (TG 4)
 - Conduct sharing studies between the mobile services and other services in order to assist the work of ITU-R JTG 5-6 (SE42 / CPG PTD)
 - Establishment of common methodology for administrations for coordination (TG4 / CPG PTD)
- CEPT Report 24 (beginning of 2008): initial consideration on white spaces



Second EC Mandate

- (1) The identification of common and minimal (least restrictive) technical conditions. These conditions should be sufficient to avoid interference and facilitate cross-border coordination noting that certain frequencies used for mobile multimedia networks may be used primarily for mobile (downlink) in one country and broadcasting networks in another country until further convergence takes place.
- (2) The development of the most appropriate channelling arrangement: in addition to (1), the CEPT is requested to develop channelling arrangements that are sufficiently precise for the development of EU-wide equipment, but at the same time allow Member States to adapt these to national circumstances and market demand. The overall aim of a coordinated European approach should be considered, implemented through detailed national decisions on frequency rearrangements, while complying with the GE-06 framework.
- (3) A recommendation on the best approach to ensure the continuation of existing Programme Making and Special Events (PMSE) services operating in the broadcasting band, including the assessment of the advantage of an EU-level approach as well as an outline of such an EU-level solution if appropriate.



ECC Deliverables

- CEPT Report 29: Guideline on cross border coordination issues between mobile services in one country and broadcasting services in another country
- CEPT Report 30: The identification of common and minimal (least restrictive) technical conditions for 790 - 862 MHz for the digital dividend in the European Union”



Block Edge Mask

Case	Frequency range of out-of-block emissions	Condition on base station in-block E.I.R.P., P (dBm/10MHz)	Maximum mean out-of-block EIRP	Measurement bandwidth
A	For DTT frequencies where broadcasting is protected	$P \geq 59$	0 dBm	8 MHz
		$36 \leq P < 59$	(P-59) dBm	8 MHz
		$P < 36$	-23 dBm	8 MHz
B	For DTT frequencies where broadcasting is subject to an intermediate level of protection	$P \geq 59$	10 dBm	8 MHz
		$36 \leq P < 59$	(P-49) dBm	8 MHz
		$P < 36$ dBm	-13 dBm	8 MHz
C	For DTT frequencies where broadcasting is not protected	No condition	20 dBm	8 MHz



Completion of the seconf EC Mandate

- CEPT Report 31: Channel arrangements (ECC PT1 - material was submitted to WP 5D)

790-791	791-796	796-801	801-806	806-811	811-816	816-821	821-832	832-837	837-842	842-847	847-852	852-857	857-862
Guard band	Downlink						Duplex gap	Uplink					
1 MHz	30 MHz (6 blocks of 5 MHz)						11 MHz	30 MHz (6 blocks of 5 MHz)					

FDD

TDD

790-797	797-802	802-807	807-812	812-817	817-822	822-827	827-832	832-837	837-842	842-847	847-852	852-857	857-862
Guard band	Unpaired												
7 MHz	65 MHz (13 blocks of 5 MHz)												

- CEPT Report 32: Future of PMSE
 - Alternative bands (L band?)
 - Use of the center gap



Completion of the seconf EC Mandate

- ECC/DEC/(09)03: harmonised conditions for mobile/fixed communications networks (MFCN) operating in the band 790 - 862 MHz
- EC Decision 2010/267/EU: on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union



Complementary ECC Studies

- Protection Ratio:
 - ECC Report 138 (UMTS)
 - ECC Report 148 (LTE)
 - May be considered in the framework of WP 6A
- ECC Report 142: Rearrangement activities for broadcasting Service in order to free the sub-band 790 – 862 MHz



Next: Mobile Service

- Mobile Service in the band 790 – 862 MHz is on the way!
 - Rearrangement activities are on going in order to release the band 790 – 862 MHz from broadcasting usage (ECC Report 142)
 - Most of the EU countries are wishing to go for the Mobile Service now, while some of them were objecting in 2006-2007
 - Auction process on the way or already completed
 - Compatibility between Mobile and Aeronautic (WRC-11 Agenda Item 1.15)?
- The possible future usage by the Mobile Service in the band 790 – 862 MHz should be considered when deploying Broadcast Service in the UHF band



Next: Additional studies

- Identification of spectrum for PMSE (L band? / FDD center gap) (WG FM) – Agenda Item 1.17 (ENG/OB) – (CPG PTD)
- Utilisation of the FDD center gap? (WG FM)
- Use of the white spaces (SE43...)
- Edge of Broadcast band / Mobile band at 790 MHz?



SEAMCAT: a sharing tool



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General information | ECC Activities | Deliverables | Events | Topics/Projects | CEPT Administrations

SEAMCAT® (Spectrum Engineering Advanced Monte Carlo Analysis Tool)

Page updated: 15 March 2010

Tutorials/ Materials	SEAMCAT software free download	SEAMCAT Technical Group (STG) main page	Online Manual (Wiki)	Trac Tool access (registration needed)
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What is SEAMCAT?



SEAMCAT® is a software tool based on the Monte-Carlo simulation method, which was developed within the frame of European Conference of Postal and Telecommunication administrations (CEPT). This tool permits statistical modelling of different radio interference scenarios for performing sharing and compatibility studies between radiocommunications systems in the same or adjacent frequency bands.

[Brief introduction to SEAMCAT](#)

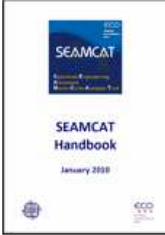
[History of SEAMCAT MoU 1997-2002 \(25 KB pdf file\)](#)

The software is maintained by ECO and distributed free-of-charge.

Webstart and Offline installation from www.seamcat.org (FAQ + [Practical tips](#))

For questions or to report bugs, please write to ECO at Seamcat@ero.dk

The new revised SEAMCAT Handbook (January 2010) is available [here](#) (6 MB pdf file)



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- Any Question?

