

# M2M spectrum opportunities in the 700 MHz range.

*The ITU World Radio Conference 2015 sets the stage for terrestrial mobile ecosystems in the range 694 – 790 MHz*

Conference on M2M Network Infrastructures for Massively Distributed  
Smart City Applications

September 30, 2015

by

**Steffen Ring, MScEE.**

CEO, Ring Advocacy LLC



**RING Advocacy ApS**  
Teglårdsvej 32  
2920 Charlottenlund  
Denmark  
www.ringadvocacy.com  
Limited Liability Company  
CVR 36534133

**Steffen Ring, MScEE**  
CEO  
Telecommunications Consultancy  
Spectrum-Standards-Regulation  
+45 4025 1881  
ring@ringadvocacy.com

# Agenda

- The significance of radio frequency spectrum
- World Regulation under the United Nations – a complicated global puzzle to avoid total chaos between member nations
- The European Position at WRC15 (AI 1.1 and 1.2) for M2M terrestrial services open for sharing 700 MHz spectrum with Mobile Broadband Public Safety Services
- The 700 MHz band plan options in 700 MHz
- Timing of the 700 MHz range availability
- Future: Orbital Services for M2M devices that are fixed and outdoor (WRC19)

# Radio Spectrum Significance

“..is as important for the wireless communications industries – and society  
.....as water is for the maritime industries – and society”

Ring Advocacy, 2015

- The cellular operators are willing to bid fortunes to get access to spectrum
- Spectrum saves lives in the Public Safety and Emergency sector
- Even phone-chargers are now wireless – and roof windows(?!)

**How could the “things” in IoT communicate, if it wasn’t for spectrum ?**

# UNITED NATIONS and ITU-R

UN



ITU-R



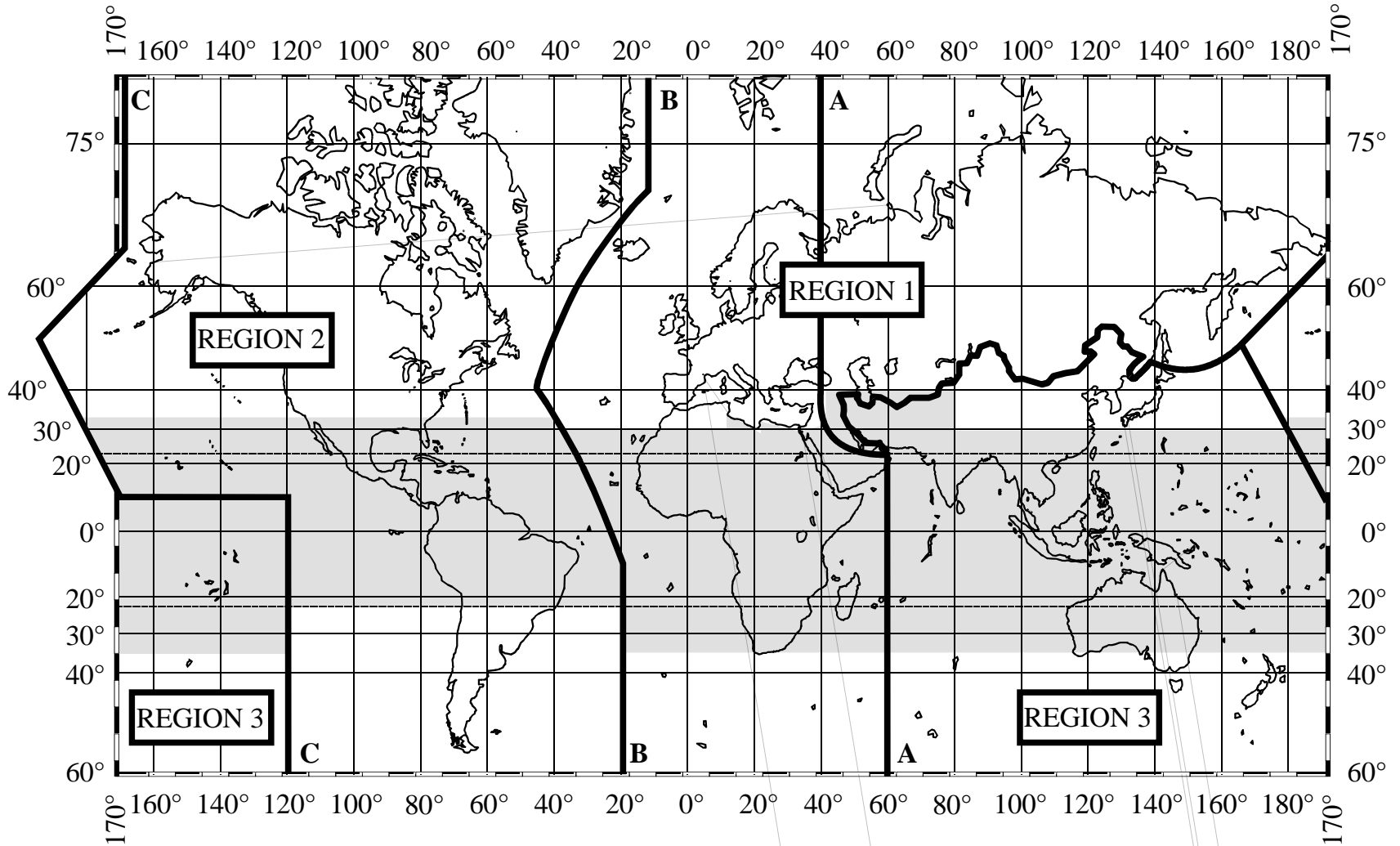
ITU-R  
WRC-15



Find here the WRC-15 Agenda and relevant Resolutions:

<http://www.itu.int/en/ITU-R/conferences/wrc/2015/Pages/default.aspx>

# The ITU-R World Regions



5-01

# THE TOP LEVEL MEETINGS OF ITU-R

Every 4 years – 184 Nations – approx 4000 delegates

- **The Radio Communications Assembly (RA) (1 week)**
  - Considers changes to the Union Structure
  - Decides Procedural Matters and Policies
  - Adopts new Recommendations and Recommendation updates
- **The World Radio Conference (WRC) (4 weeks)**
  - Considers and agrees changes/updates to the Radio Regulations (RR)
  - Identifies new radio spectrum bands for specific usage
  - Agrees on the agenda for the next WRC
- **The Conference Preparatory Meeting (CPM) (1 week)**
  - Elaboration of the Agenda and CPM Report for the support of the Work of the next Conference

<b>RA</b>	<b>WRC</b>	<b>CPM</b>
1 week	4 weeks	1 week

# The Regional set-up of ITU-R



Region 1



Region 2



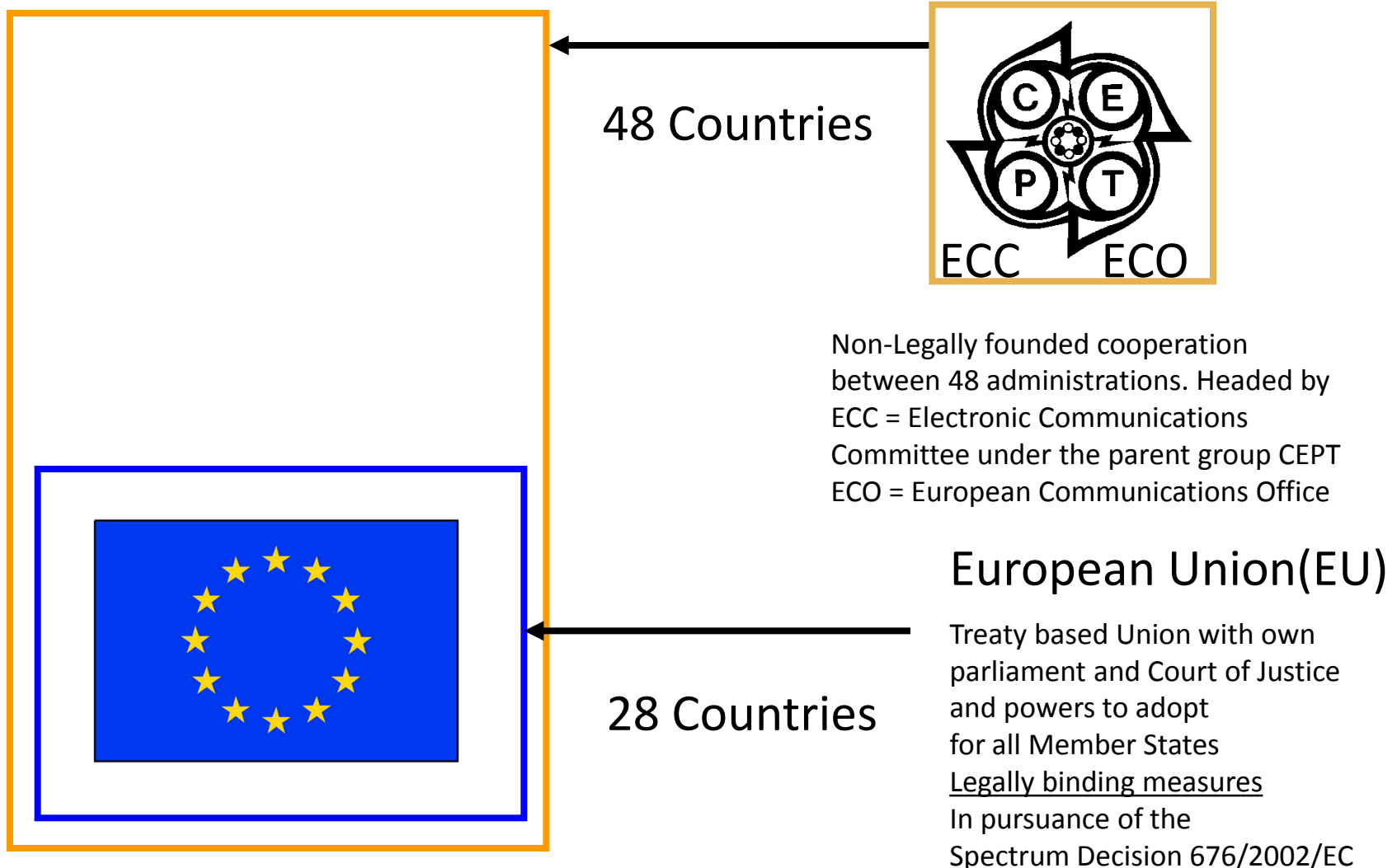
Industry  
Canada    Industrie  
Canada

Region 3



Regional positions are prepared for each region as input to ITU-R WRC's

# The European Spectrum Regulatory set-up





# Europe – 48 countries – 22 official languages



48 CEPT Countries  
28 EU Member States

Albania, Andorra, **Austria**, Azerbaijan, Belarus, **Belgium**, **Bulgaria**, Bosnia and Herzegovina, **Croatia**, **Cyprus**, **Czech Republic**, **Denmark**, **Estonia**, **Finland**, **France**, Georgia, **Germany**, **Greece**, **Hungary**, Iceland, **Ireland**, **Italy**, **Latvia**, Liechtenstein, **Lithuania**, **Luxembourg**, **Malta**, Moldova, Monaco, Montenegro, **Netherlands**, Norway, **Poland**, **Portugal**, **Romania**, Russian Federation, San Marino, Serbia, **Slovak Republic**, **Slovenia**, **Spain**, **Sweden**, Switzerland, The Former Yugoslav Republic of Macedonia, Turkey, Ukraine, **United Kingdom** and Vatican City.

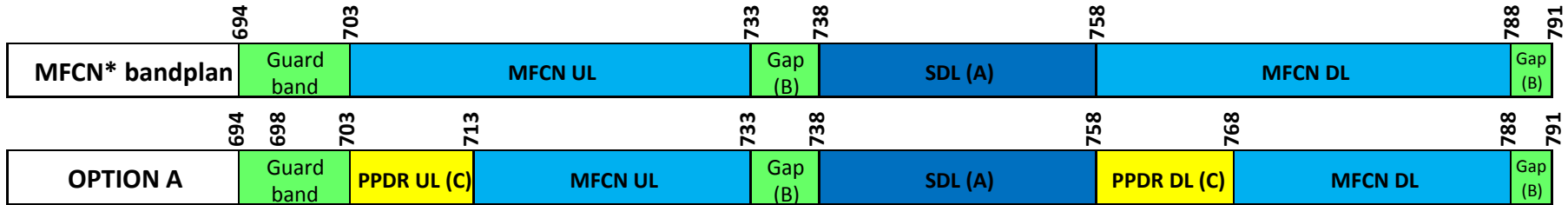


<http://www.eucountrylist.com/>

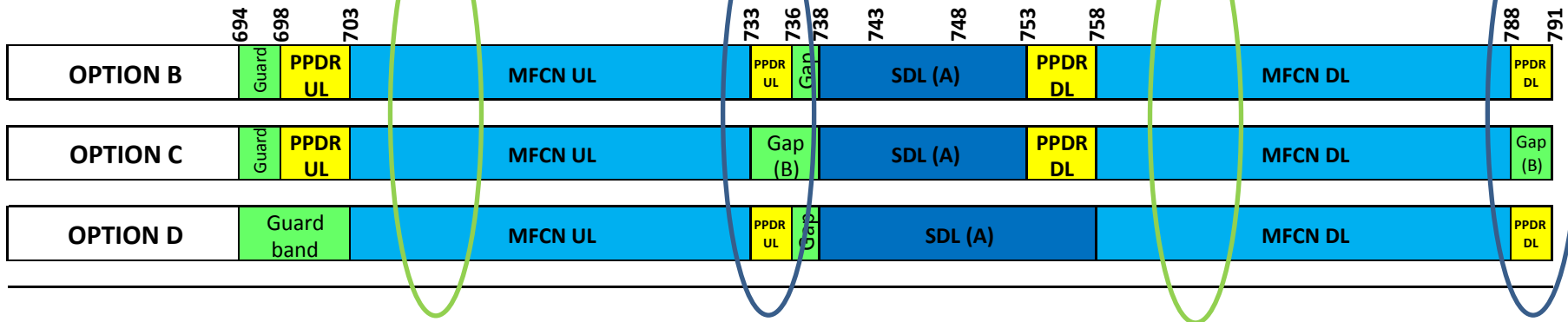
Total EU population around 500 million

**CEPT= Conference Europeenne du Post et Telegraphique**

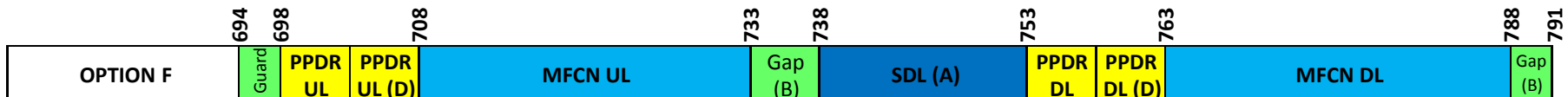
# The 700 MHz spectrum options M2M - 2016+



## PPDR in spectrum assigned to FPDR and M2M:



## PPDR in a combination of MFCN and dedicated spectrum:



MFCN\* = Mobile Fixed Communication Networks – Spectrum for Mobile Broadband Operators

## Timing for the 700 MHz allocations to LTE

- In general all 48 European countries will wait until right after WRC15 with initiating plans for 700 MHz allocations

However:

- Germany has already auctioned all of the 2x30 MHz MFCN slots
- France has announced a new dedicated PPDR allocation in the non-harmonized spectrum 2x5 MHz and 2x3 MHz
- Finland has announced as the first country to start allocating 700 MHz Mobile spectrum from Jan 2017 (subject to successful negotiations with the RUS Fed to seize terrestrial BCAST in the 700 MHz band.
- Sweden has announced plans to start the process by June 2017

# Conclusons for terrestrial M2M in Europe

Option 1: (2 x 3 MHz dedicated)

Sharing with PPDR the spectrum 733 – 736 MHz (UL) paired with 788 – 791 MHz (DL)  
Will provide a very high QoS and network stability as required by the PPDR users

Option 2: (Commercial operator)

Enter agreement with Mobile Broadband Operators in the 700 MHz MFCN 2 x 30 MHz  
to provide the network services to the M2M operator

# Looking slightly ahead:

A Nano/Pico satellite spectrum study slated for consideration at WRC-19

Spectrum below 1 GHz

- CEPT CPG (Conference Preparatory Group) just adopted a new Resolution under AI 10 for the work of the 2019 WRC
- The fast growing market for Nano/Pico satellites calls for more spectrum
- Could be envisioned to service IoT/M2M outdoor devices across the globe, in a VERY cost efficient way.
- The typical amount of spectrum under study will be 2 x 3 MHz

# WRC-15 from Nov 2 – 27, 2015



From WRC-07 in one of the small break-out rooms