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Spectrum Sharing in Europe/France

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Spectrum sharing for ANFR

A policy objective

- ANFR is publicly supporting spectrum sharing: to improve spectrum efficiency and usage opportunities
- ANFR supports European initiatives, i.e. within RSPG, ECC…

ANFR has developed a blockchain for sharing/coordination among PMSE in big event

- New development for use during Olympic Game Paris 2024
- Blockchain is an easy, scalable and interesting solution for database implementation

France has to take into account the European dimension

- Harmonisation benefits
- Close link between harmonised standard (internal market) and spectrum regulation

European initiatives, policy

RSPG Opinion and report on Spectrum (RSPG21-022 , RSPG21-016**)**

Sharing conditions

- Promoting innovative and dynamic sharing solutions, on a case by case
- “Share it or loose it” approach

Strengthening trust and confidence

- Building trust among all spectrum users, including by strengthening market surveillance, is a key means to increase spectrum sharing
- Key role in Europe for the ETSI/CEPT cooperation

Investigation of more dynamic spectrum sharing options

- Need to develop in Europe proof of concept systems: identifying key pioneer bands and initiatives?
- Temporary “test & trial” / “innovation & trial” licences (sandboxes)

Coordinated actions

- Sharing experience on dynamic spectrum management, funding of EU research

European initiatives, technical harmonisation

Foster geolocation database solutions in Europe

- Need for **regulatory bricks** to support implementing specific sharing/coexistence solutions, e.g. generic requirements for controlling emission/geolocation, high-level description of communication interface with the database…
  - **Lower 6 GHz WAS/RLAN could provide a good "proof of concept" for Europe**

CEPT and ETSI to implement such approach in a multi-country context, with cross-border dimension

Support sufficient guarantee on "User access restrictions"

- Need for sufficient guarantee that equipment cannot be modified by the user in a way which would affect the sharing/coexistence solutions
  - Meeting the sharing conditions in certain frequency bands cannot rely on information provided by the "packaging" of the device on user restrictions

Geolocation sometimes needed to address cases where regulations differ among Member States, e.g. RLAN 5.8 GHz – CDC (Country Determination Capability)

Foster increased robustness and resilience to interference of radio equipment

- Development of high performance receiver specifications and inclusion of appropriate essential requirements and test specifications into harmonised and product standards, for all equipment (see ECC Report 310)

3.8-4.2 GHz for local 5G verticals

Sharing is an obvious solution for local access to spectrum

- RSPG recommended in June 2021 investigating this band to support **local verticals (low/medium power)**
- European Commission mandated CEPT to define harmonised technical conditions (target: 2024)
- CEPT is studying
    - Sharing with earth stations, which will continue to operate in the band (incumbent/new stations)
    - Protection of radioaltimeters and of MNO below 3.8 GHz
    - Frequency reuse / synchronisation issues
    - Low/medium power (e.g. ≤ 48 dBm)

Initiative in France with regard to 5G for manufacturers and vertical sectors

- Following Ph. Herbert's Report, the French government announced new measures to facilitate access to 5G for manufacturers and vertical sectors in the country
- Arcep will grant authorisation in the 3.8 GHz to 4.0 GHz band (ongoing process) with the aim to switch to the harmonised framework after 2024

"Static" sharing to use the "white space" of the earth stations

AFC / “Standard” RLAN power in the lower 6 GHz

- 5945-6425 MHz authorised for LPI and VLP RLAN in Europe
  - Initial focus was LPI and VLP
  - Interest for “standard power” from WiFi industry

- France initiated a Work Item in CEPT **to enable outdoor 1W/4W equipment under the control of an AFC**

- This will “force” the development of **regulatory bricks** to support implementing specific sharing/coexistence solutions, e.g. generic requirements for controlling emission/geolocation, high-level description of communication interface with the database…

  ➢ **6 GHz WAS/RLAN could provide a good “proof of concept” for Europe, making other spectrum users confident: initiative in 5945-6425 MHz under development**

WiFi 5 GHz: a yet-to-be-solved interference case

Interference to meteorological radars still there and even increasing since 2008

Same situation over all Europe

- Regulation is in place: ETSI Harmonised standard and regulations are improving DFS implementation and related features. Manual deactivation is forbidden.
- European system based on conformity declaration and market surveillance:
  - WiFi equipment software are sometimes changed by the user/operator (DFS sometimes creates instability of the network)
  - Market surveillance is challenging (e.g. Internet purchase)
  - Identification of the source of interference is a nightmare

This precedent makes other spectrum users uncomfortable to accept sharing

- Need for sufficient guarantee that equipment, including software, cannot be modified by the user in a way which would affect the sharing/coexistence solutions

5.9 GHz ITS

Road ITS are involved in many dynamic sharing issues, mainly discussed within ETSI

1) Road ITS and tolling system
   - "Static" database for existing toll barriers
   - Beacons for new toll barriers

2) Road ITS and Rail ITS (CBTC)
   - Geolocation/database or beacons? Who bears the cost?…

3) Road ITS: G5 (802.11p/11bd) vs. C-V2X (LTE/NR) technologies
   - All solutions are implying modifications of the existing standards and possible reduction of performance
   - Are industry or other stakeholders able to provide a solution?

Many other examples of similar sharing gordian knot…
Sharing cannot only be a theoretical construction: there are many trade-off to be made

Olympic game Paris 2024

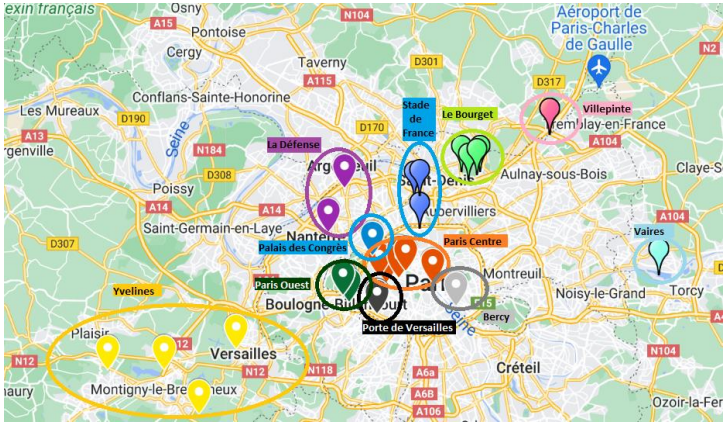
A “crash-test” for sharing:

- More than 100 000 assignments expected
- Tremendous spectrum need for wireless camera and microphones
- Publication of the frequency plan in July 2022
- For wireless camera, about 1800 MHz identified in the frequency plan compared to 400 MHz usually made available in “big event” such as Tour de France

Example of sharing:

- With radars (L band, S band)
- With fixed service (6 GHz)
- With earth stations (4 GHz, 2 GHz…)
- With defence

Sharing « lessons » will be interesting



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