

# REGULATORY CHALLENGES FOR SATELLITE D2D OPERATIONS IN EUROPE

## ITU-EKIP Regional Regulatory Forum for Europe 2024

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## Direct to Device satellite solutions

- **Direct to device:** same device as for terrestrial connectivity (smartphones ...)
- **In MNO/IMT spectrum**
  - **WRC-27 Agenda item 1.13)** for IMT bands between 694 MHz and 2,7 GHz
  - Some provisional European implementation may be defined (if needed) before 2027 (CEPT/FM44)
- **In other spectrum allocated to Mobile Satellite Service (MSS)**
  - Using frameworks/solutions already in place (Apple/Globalstar, Mediatek/GSO, QC/Iridium ...)
  - **Expiry in 2027 of EU 2 GHz MSS authorizations**, which may trigger additional opportunities for broadband D2D (see [RSPG opinion](#))
  - Spectrum for MSS low data rate applications may respond to some needs (**IoT, emergency, messaging ...**)
    - MSS < 1 GHz
    - future MSS allocation studied under WRC-27 agenda item 1.12
    - Satellite SRD in 862-870 MHz (ECC Report 357, draft ECC Decision)

## Direct to Device (D2D) market in IMT spectrum

- **European market remains limited**

- Mobile coverage in Europe is good

France: no large territories in-between city coverage  
vs satellite spots 20/50 km

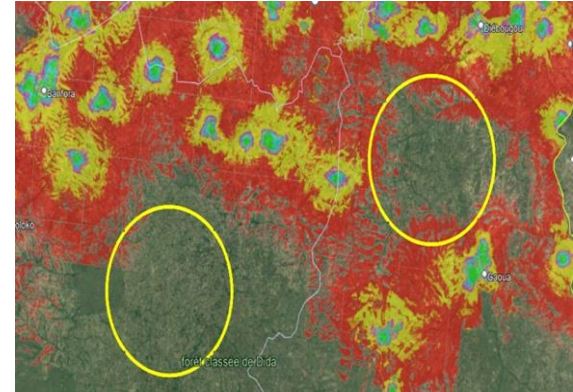
- MNO may decide to release one block nationally
  - Small countries = close-in borders

- **Some market opportunities**

- Few large uncovered areas, isolated islands ...
  - Need for countries to complete national coverage (and some IMT frequency bands are not yet authorized in some countries)
  - Special case: international water (ships, cruises ...), same market as WiFi or IMT communications onboard vessels (ESIM backhauling)

- **D2D capacity intrinsically limited**

- Broadband Fixed Satellite : due to antenna discrimination, the more satellites, the more capacity
  - D2D: only one satellite can offer communication in a spot x block + limited terminal eirp



## National regulation issues for D2D in MNO's spectrum

- **MNO's spectrum right of use**
  - In most countries, there will be a need for modifying the MNO licence
  - EU EECC Article 18 requires consultation of all interested parties
  - Regulators will fix technical and regulation issues
- **Technical issues to be addressed**
  - Ensuring spectrum efficiency: also interest of the MNO
  - Ensuring protection of adjacent blocks (other operators)
  - Cross-border issues
- **Regulation issues**
  - Competition: how many satellite players will ultimately offer D2D connectivity?
  - Lawful interception
  - Emergency call

## European harmonisation

- **RSPG opinion mid-2025** on Satellite D2D connectivity: national authorisations, current/expected use of potential bands, technical issues and any need for regulatory coordination or technical harmonisation across the EU;
- **CEPT/ECC work item FM44\_47** “to develop an understanding of national direct-to-cell satellite connectivity”
  - If needed (=supported by at least 5 countries), an ECC decision could be developed for a provisional framework (until WRC-27)
- **Draft decision for Satellite SRD in the band 862-870 MHz**
  - Based on [ECC Report 357](#)
  - Wake-up downlink signal - Operation under RR No 4.4
  - Draft ECC Decision
    - Pfd limit to protect SRD and other usages
    - Commitment to comply with No. 17 and 18.4 of the RR (secrecy)

## Cross border issues: WRC-27 Agenda Item 1.13

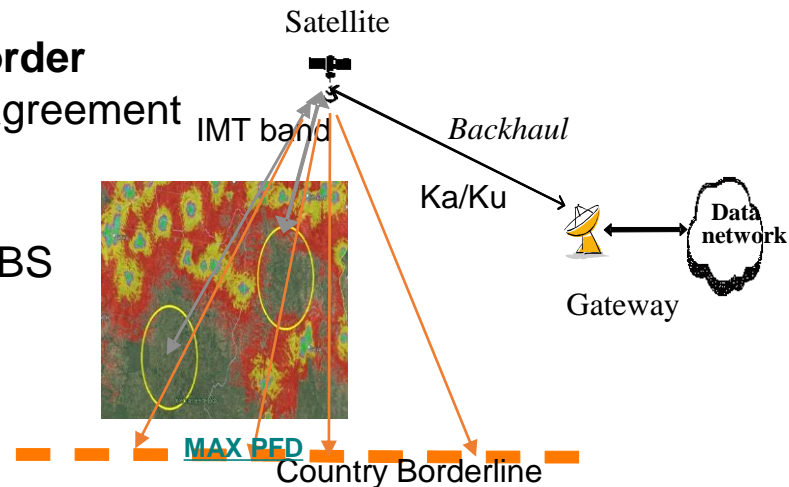
### **WRC-27** agenda item 1.13

*“to consider studies on possible new allocations to the mobile-satellite service for direct connectivity between space stations and International Mobile Telecommunications (IMT) user equipment to complement terrestrial IMT network coverage, in accordance with Resolution 253 (WRC-23);”*

- **IMT bands between 694 MHz and 2.7 GHz**
- **Same terminal for Terrestrial and Non Terrestrial** should be assumed  
... but not excluding relaxation of terminal eirp in future 3GPP NTN standards
- Preparatory work in ITU-R: WP4C

## Cross border issue: protecting incumbent services/applications including IMT Terrestrial Network (TN)

- The solution is to define at WRC-27 **pdf at the border**
  - **hard limits:** no exceedance unless explicit agreement
  - Also to avoid unintended roaming
- Work on pdf already carried out at WRC-23 for HIBS (balloon or drone used as base stations)



- Many incumbent services/applications to be addressed in ITU preparatory studies:
  - IMT terminals (all bands) and base stations (certain bands)
  - Depending on the frequency band, other incumbents,
    - In-band : broadcasting, fixed links, aeronautical radionavigation, earth stations...
    - Adjacent band : radio astronomy, S-band radars ...

## Other ITU regulatory issues under Agenda Item 1.13

- **Which status for the MSS allocation?**
  - Underlying principle: the use of D2D terminals should be subject to national authorization – normally under a revised MNO authorization unless operation is in an IMT band not yet authorized.
  - MSS allocation could be with secondary status to reflect priority to terrestrial network ... but what is important is to protect other usages.
- **Use outside national territories** (international waters/airspace)
  - Possible compatibility issues with IMT communications onboard vessels
  - Need to protect territorial waters
- **ITU coordination rules**
  - For operations of D2D terminals in national territories, no need for **first come/first served** principle since the use is under the national MNO authorization + pfd at the border
  - In international waters, ITU coordination may be necessary



## CONCLUSIONS

Even if satellite D2D remains a niche market, **regulatory challenges can be addressed successfully to foster coverage and innovation:**

- **There is no major regulatory impediment for satellite D2D services in Europe** before (if needed) or after WRC-27
- **ITU WRC-27 will define the international regulatory framework for satellite D2D.** Substantial work to be carried out, compromises to be reached, but no major obstacles.

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